P/NO : AFN30014623

MARCH, 2020

SERVICE MANUAL

MODEL: RN5

LG

Mini Hi-Fi Audio
SERVICE MANUAL

MODEL: RN5

CAUTION
BEFORE SERVICING THE UNIT, READ THE “SAFETY PRECAUTIONS” IN THIS MANUAL.

CONTENTS

SECTION 1

SUMMARY

CONTENTS

PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO PRODUCTS

IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by LG Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

CAUTION : Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

GRAPHIC SYMBOLS

The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of noninsulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.

The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

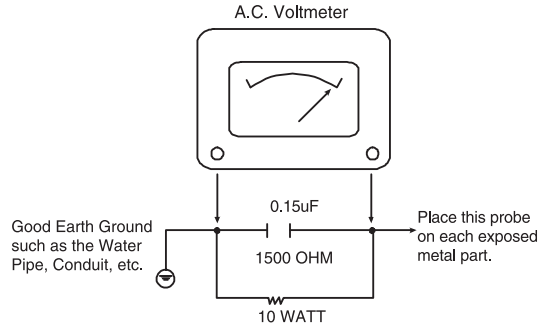
CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items trans-ported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

SERVICING PRECAUTIONS

CAUTION: Before servicing the Audio products covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS.
NOTE: if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publication, always follow the safety precautions.
Remember Safety First :

General Servicing Precautions

1. Always unplug the Audio products AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this Audio products or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

5. Do not apply AC power to this Audio products and / or any of its electrical assemblies unless all solid state device heat sinks are correctly installed.

6. Always connect the test instrument ground lead to an appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1Mohm.
Note 1: Accessible Conductive Parts include Metal panels, Input terminals, Earphone jacks,etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate an electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

HIDDEN KEY MODE

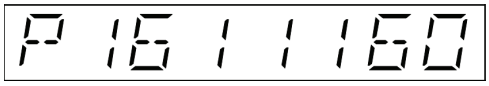
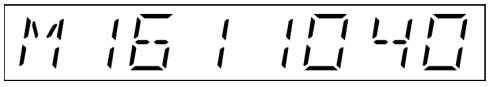
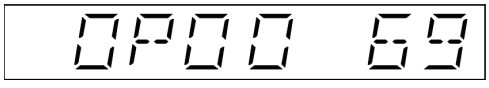
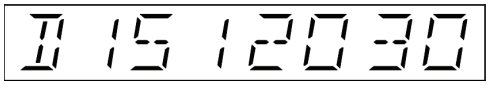
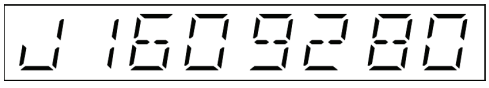
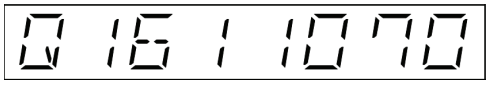
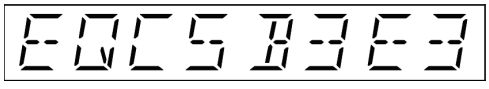
1. HIDDEN KEY MODE TABLE

HIDDEN MODE	ENTRANCE KEY(Audio)	EXIT KEY
Version Check	Front 'Stop' ■ + Remote Control Key 'Play' ▶/II for 5s	Remote Control Key 'Play' ▶/II for 1.5s
EEPROM INITIAL	Front 'Stop' ■ + Remote Control Key ' ⏮ ' for 5s	Auto exit

2. HIDDEN KEY MODE DESCRIPTION

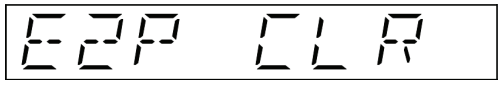
2-1. Version Check

- Function : Version Check.
- Entrance Key : Front 'Stop' + Remote Control Key 'Play' for 5s.
- Exit Key : Remote Control Key 'Play' for 1.5s.
- Operation explanation : Remote Control Key ⏮ OR ⏭.

VFD Display (Example)	Result
	MCS Version
	MICOM Version
	OPTION Version
	DEMO Version
	DJ PRO Version
	EQ Version
	EQ Check sum Version

2-2. EEPROM Initial

- Function : Initialize data stored in EEPROM and BACKUP RAM data.
- Entrance Key : Front 'Stop' + Remote Control Key ' ⏮ ' for 5s.
- Exit Key : Auto exit.
- Explanation : 'E2P CLR' is displayed on the VPD and turn off the power automatically.



PROGRAM DOWNLOAD GUIDE

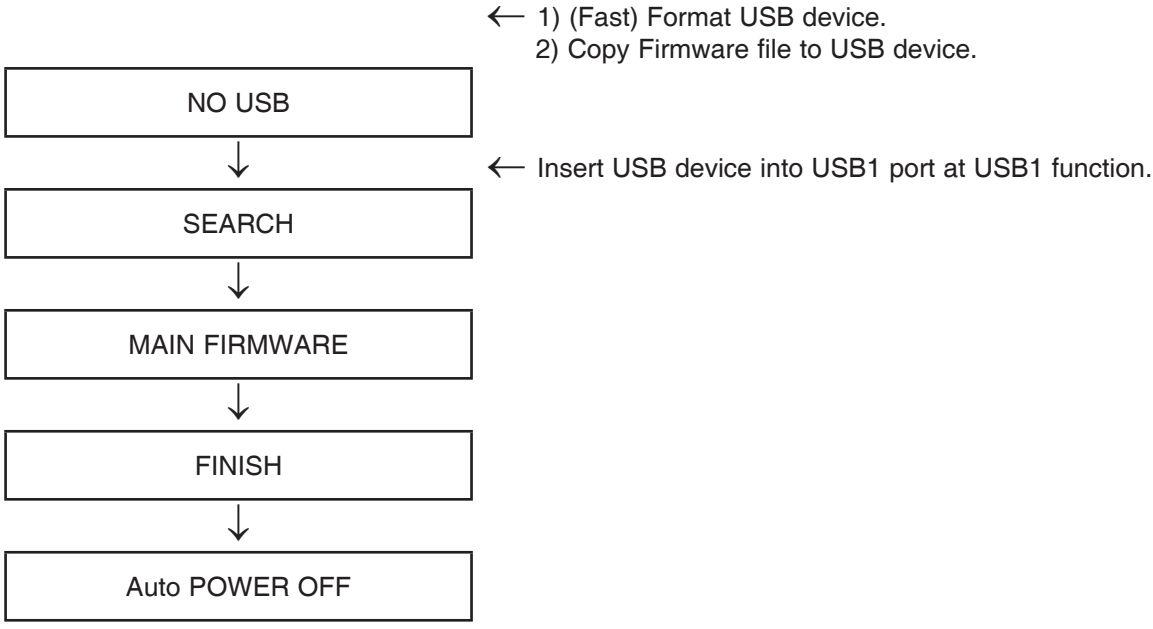
1. MAIN MCS PROGRAM (MAIN MCS CHIP)

Download program file name must be MAIN_RN9_RN7_RN5_HAC_YYMMDDX.bin

If security program(Water Wall) is activated on PC, you must save the file to the USB storage device and disable the security software, then download the file to your set.
Downloading file proceeds at USB1 function.

Caution: When downloading the file, you should neither unplug the USB device, change to the other function, nor power off the device. USB device must be unplugged when the downloading process is completed.

ON VFD DISPLAY SCREEN



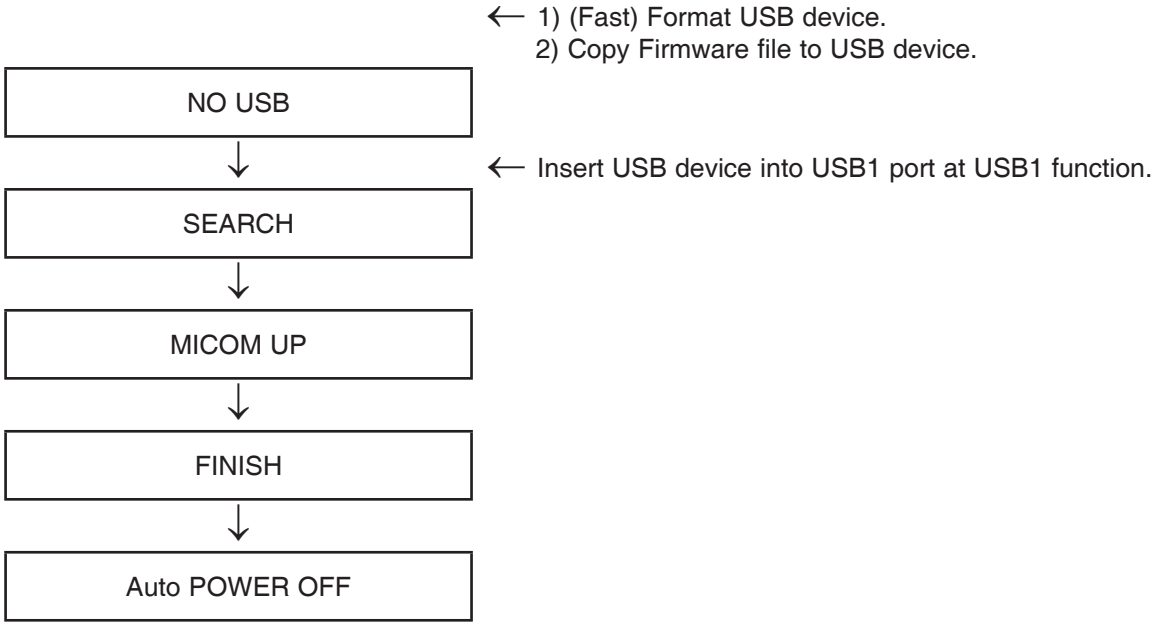
2. MICOM PROGRAM

Download program file name must be MICOM_ON_RN_HAC_YYMMDDX.HEX

If security program(Water Wall) is activated on PC, you must save the file to the USB storage device and disable the security software, then download the file to your set.
Downloading file proceeds at USB function.

Caution: When downloading the file, you should neither unplug the USB device, change to the other function, nor power off the device. USB device must be unplugged when the downloading process is completed.

ON VFD DISPLAY SCREEN

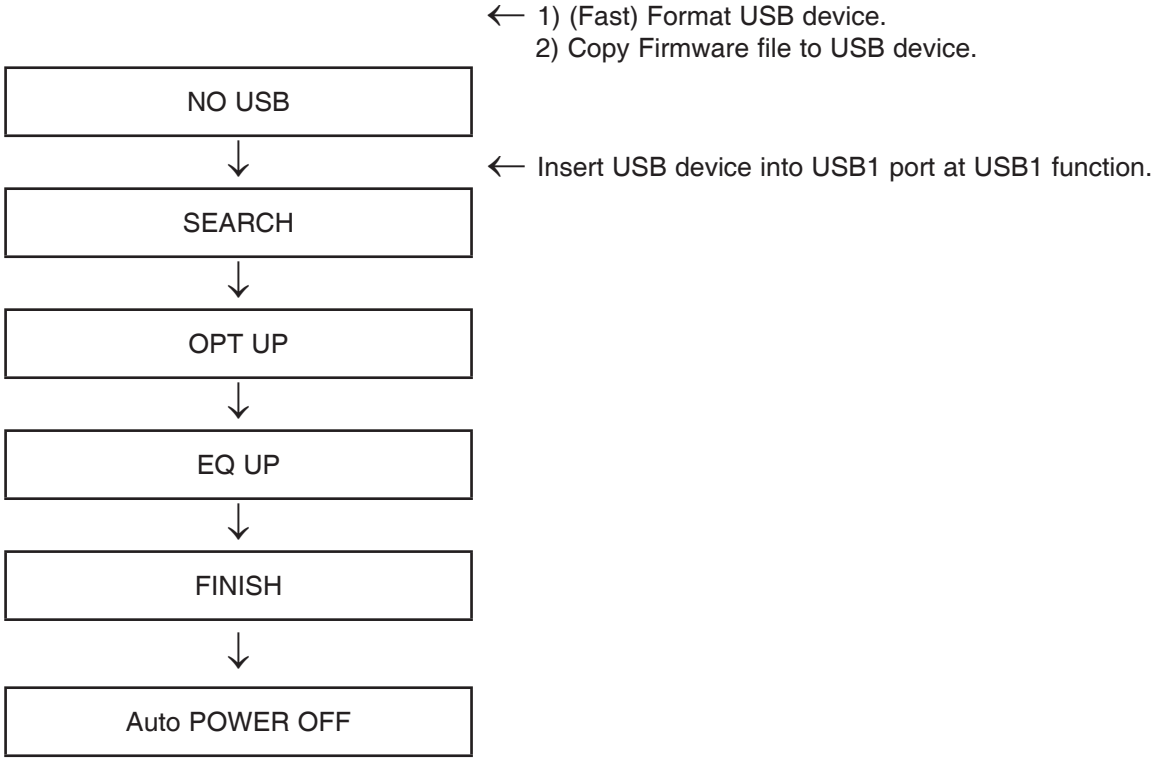


3. OPTION & EQ PROGRAM

Download program file name must be OPTEQ_RNx_HAC_YYMMDDX.BIN
(*RNx : “RN9”, “RN7” or “RN5”, depends on model option.)
If security program(Water Wall) is activated on PC, you must save the file to the USB storage device and disable the security software, then download the file to your set.
Downloading file proceeds at USB function.

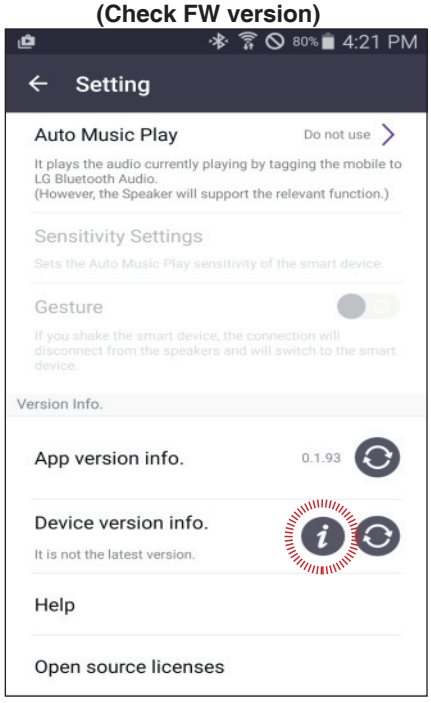
Caution: When downloading the file, you should neither unplug the USB device, change to the other function, nor power off the device. USB device must be unplugged when the downloading process is completed.

ON VFD DISPLAY SCREEN



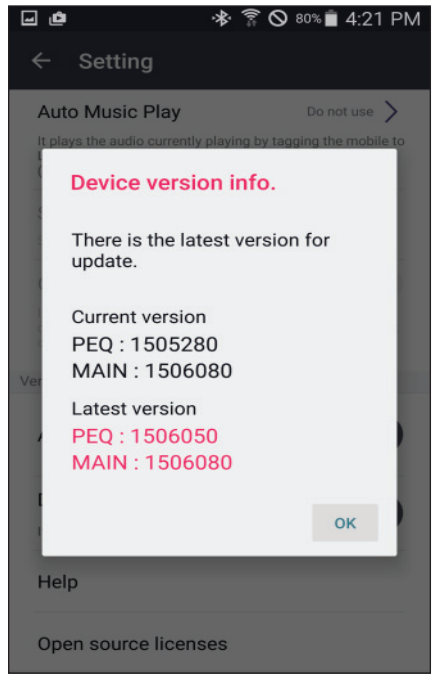
FOTA UPDATE STEP USING BT APP

Step1 : App connecting (Check FW version)



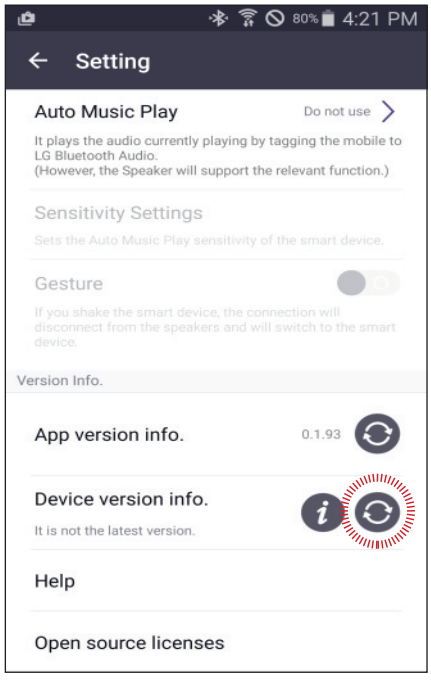
After connecting the BT App with SET, the user could find the “Device Version info” on Setting tab.

Step2 : Device version info



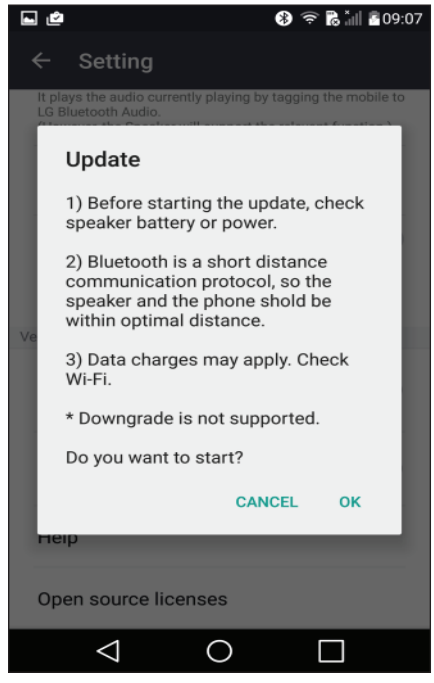
When touch the “Device Version info” button, user could find the current and latest SET version on pop-up menu.

Step3 : Select update button



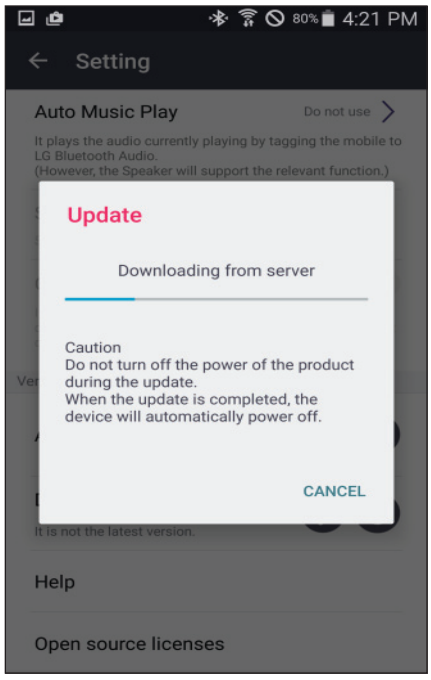
When touch the “Update” button, user could update the SET firmware using FOTA.

Step4 : Confirm update



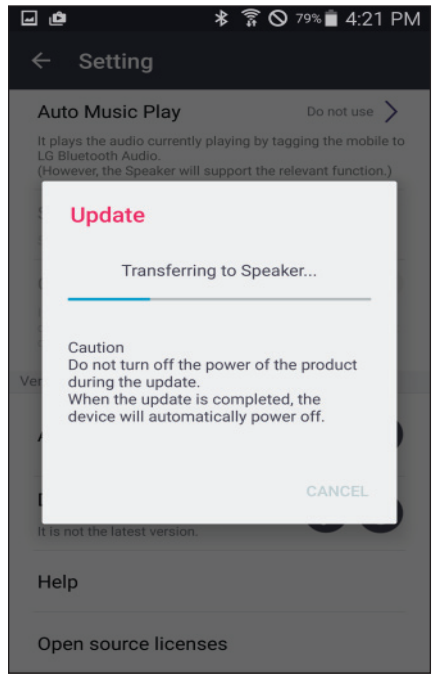
Select the OK button on the caution message.

Step5 : Download from CDN server



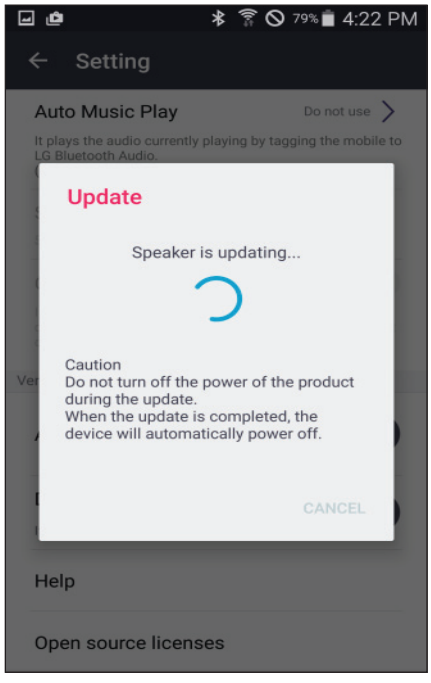
1st step is download from CDN server to smart phone. The progress bar is displayed on BT App.

Step6 : Transfer FW



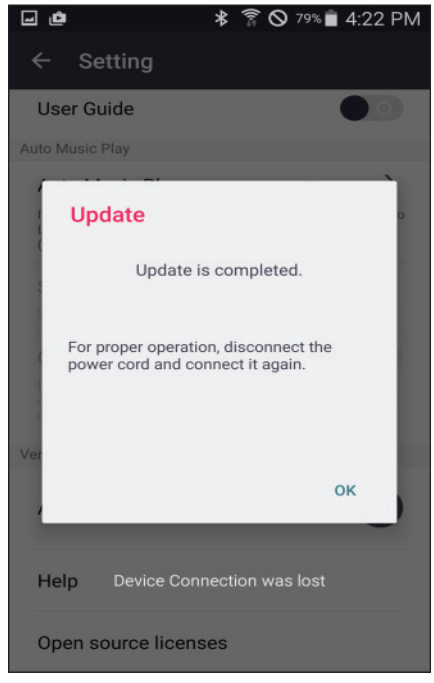
After completed the download from server, smart phone start to transfer the firmware to the SET. The progress bar is displayed on BT App.

Step7 : FW Flash Writing



After completed the download from the smart phone, the SET overwrite the firmware to flash memory.

Step8 : FOTA complete



When finishing the flash memory writing, pop-up message about finish is displayed and the SET auto power off.

SPECIFICATIONS

• GENERAL

Power requirements	Refer to the main label on the unit.
Power consumption	Refer to the main label on the unit.
Dimensions (W x H x D)	Approx. 330.0 mm x 685.0 mm x 344.0 mm
Operating temperature	5 °C to 35 °C
Operating humidity	5 % to 60 % RH

• INPUTS

Microphone (MIC IN) Sensitivity	20 mV (1 kHz), 6.3 mm jack x 1
Guitar (GUITAR IN) Sensitivity	190 mV (1 kHz), 6.3 mm jack x 1

• TUNER

FM Tuning Range	87.5 to 108.0 MHz or 87.50 to 108.00 MHz
DAB Tuning Range	174.928 to 239.2 MHz

• SYSTEM

Frequency Response	250 to 20,000 Hz
Signal-to-noise ratio	More than 80 dB
Dynamic range	More than 80 dB
Bus Power Supply (USB)	5 V ⎓ 500 mA
Available Digital Input Audio Sampling Frequency	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
Available Digital Input Audio format	Dolby Audio, PCM

• Design and specifications are subject to change without notice.

MEMO

SECTION 2

CABINET & MAIN CHASSIS

CONTENTS

DISASSEMBLY INSTRUCTIONS

1) Remove the 6 screws.

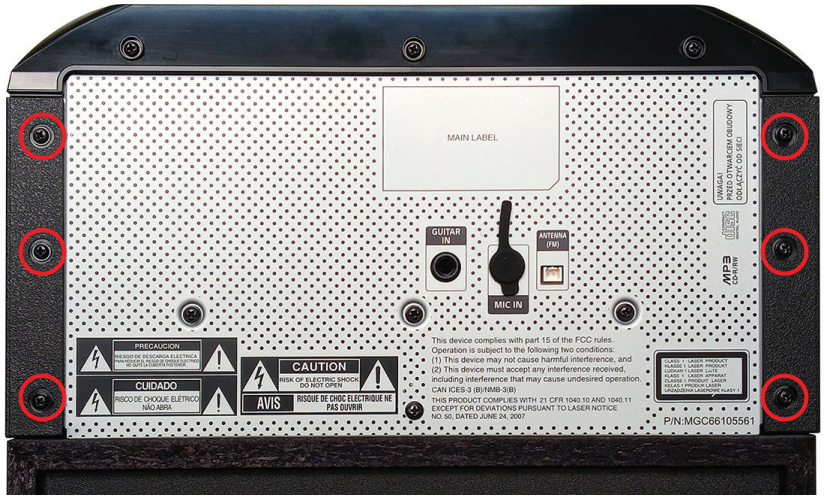


Figure 1. Panel Side L/R disassembly - 1

2) Disassemble each of the 2 screws located inside the handle.

Figure 2. Panel Side L/R disassembly - 2

3) Pull out Cover Side Assembly L/R in the backward direction.

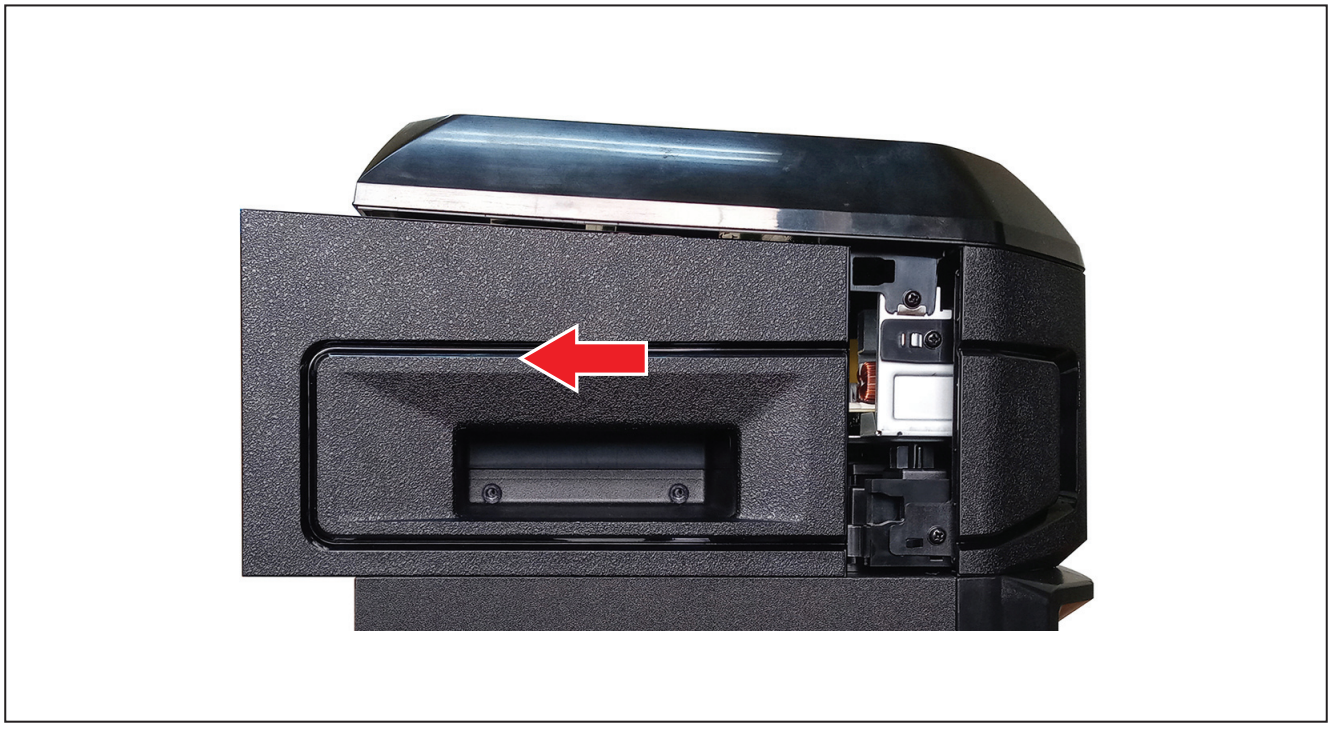


Figure 3. Panel Side L/R disassembly - 3

4) Remove the 3 screws.

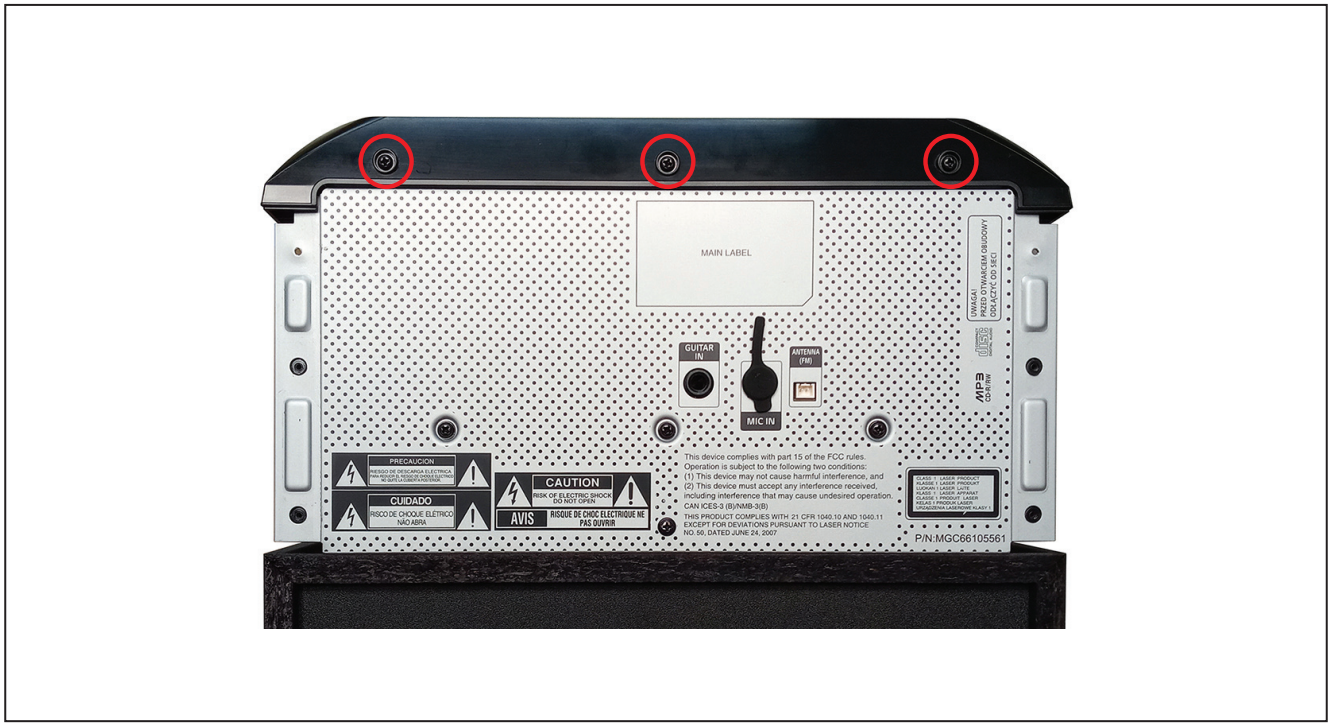


Figure 4. Panel Top disassembly - 1

5) Remove the 2 screws on the left and right sides and then FFC cable of TOP PCBA.

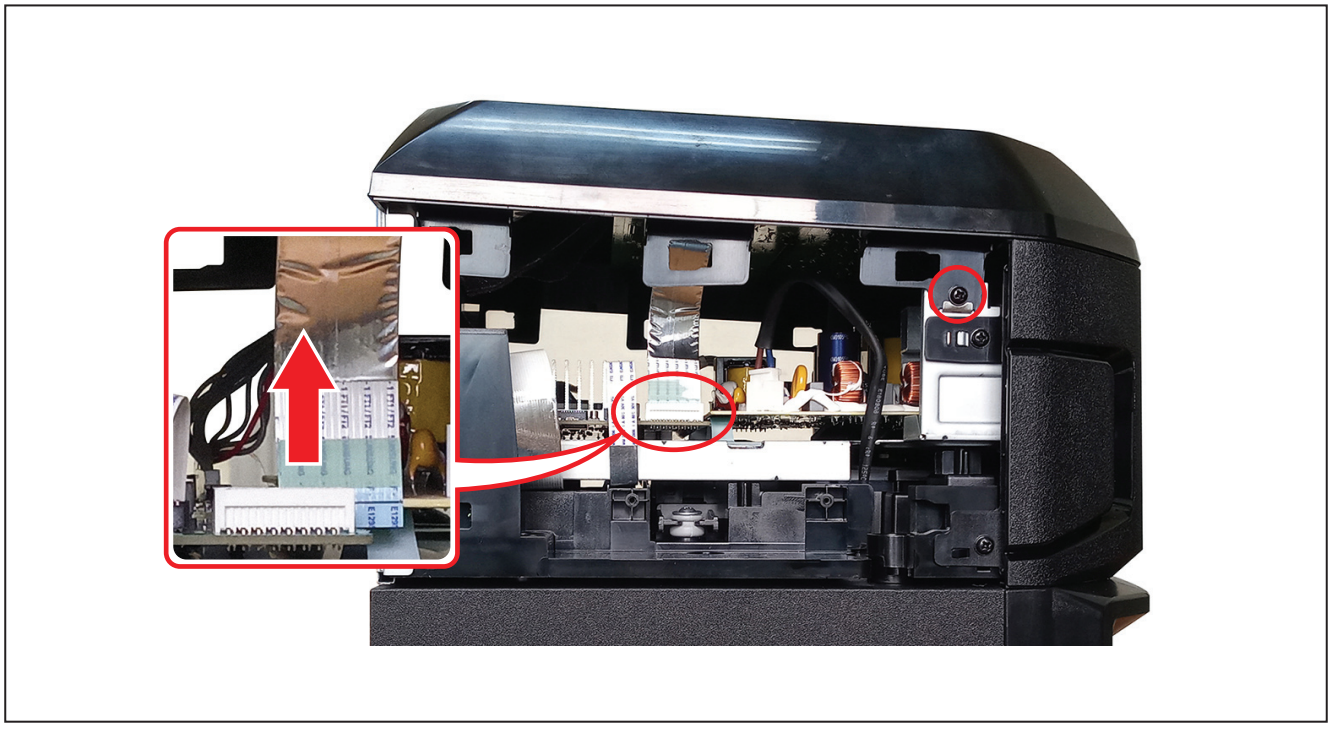


Figure 5. Panel Top disassembly - 2

6) As shown in the figure, remove the Panel Top by pushing the front part and lifting the rear part.

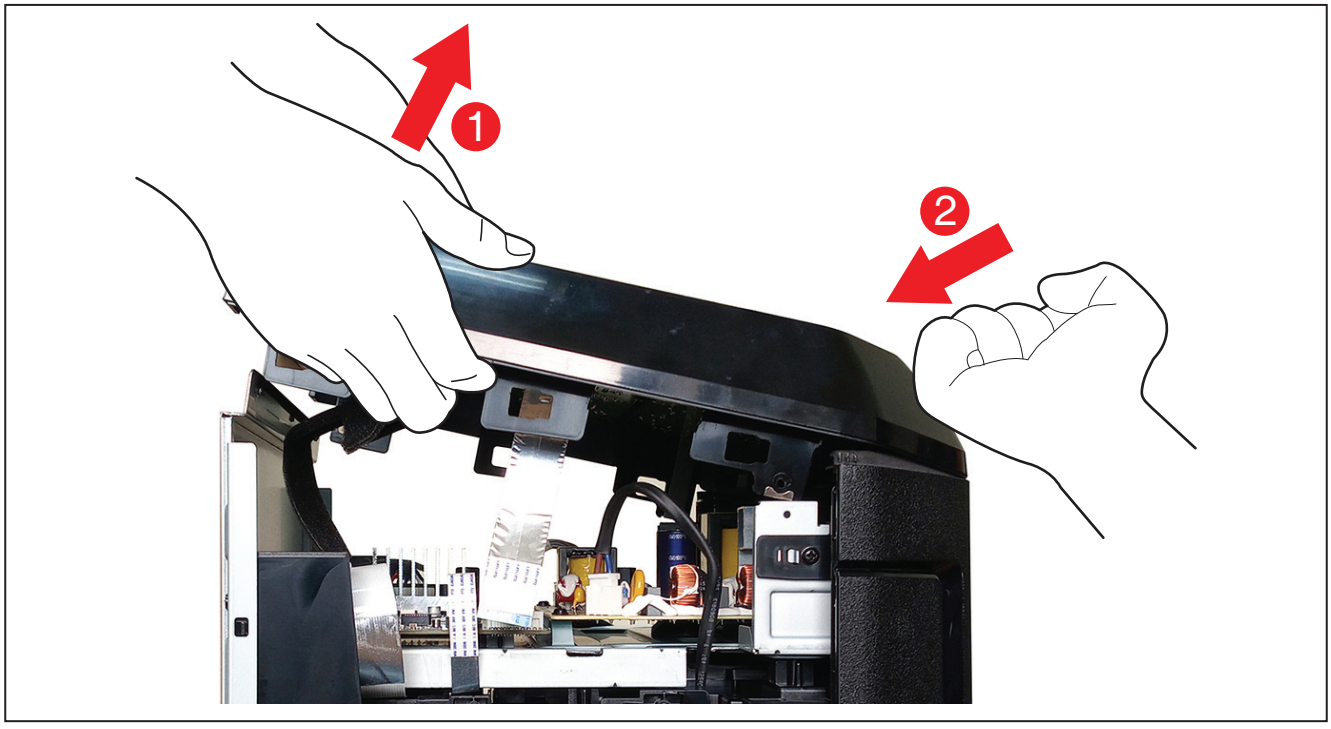


Figure 6. Panel Top disassembly - 3

7) Remove the 4 screws on the Panel Rear.

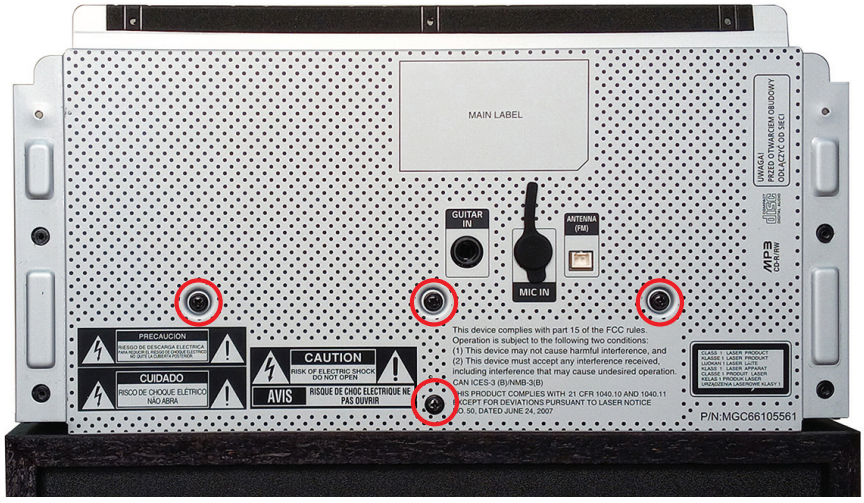


Figure 7. Panel Rear disassembly

8) Bracket MD + Frame Main Screw 7 EA Disassembly.

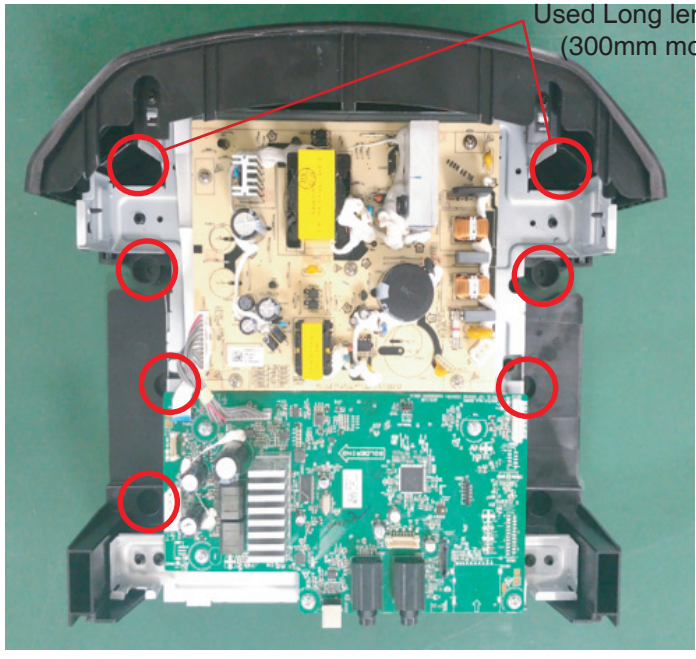


Figure 8. Main Set disassembly - 1

9) Remove the IR Receiver & Speaker LED Connector / Speaker Network cable.

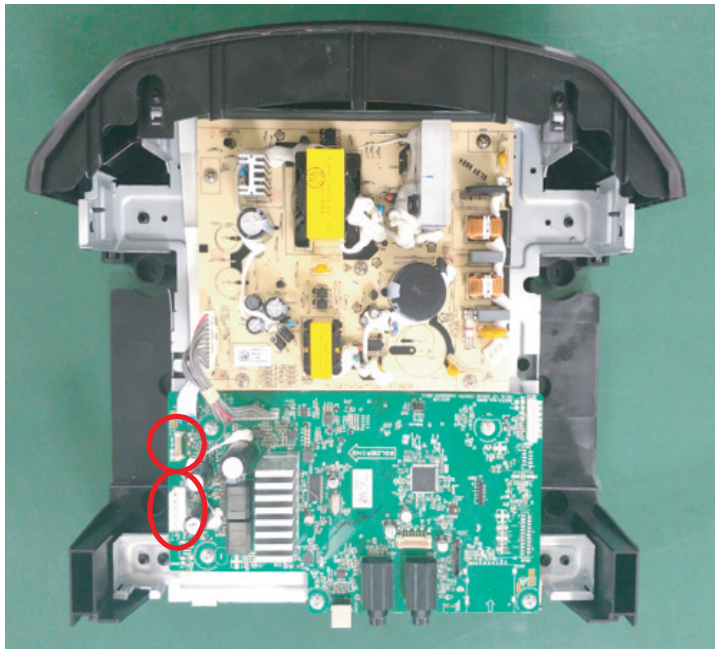


Figure 9. Main Set disassembly - 2

10) Power Cable Disconnection

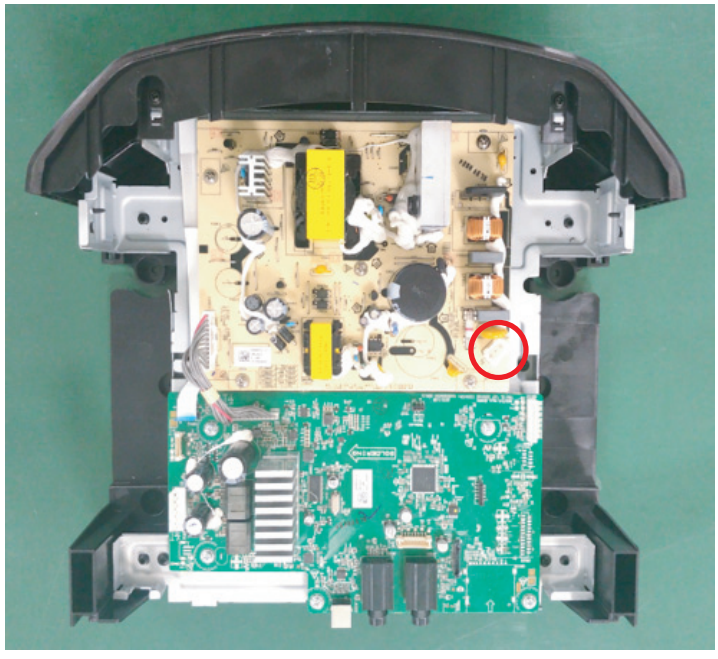


Figure 10. Main Set disassembly - 3

11) Grasp both sides and pull upward to remove the assembly.

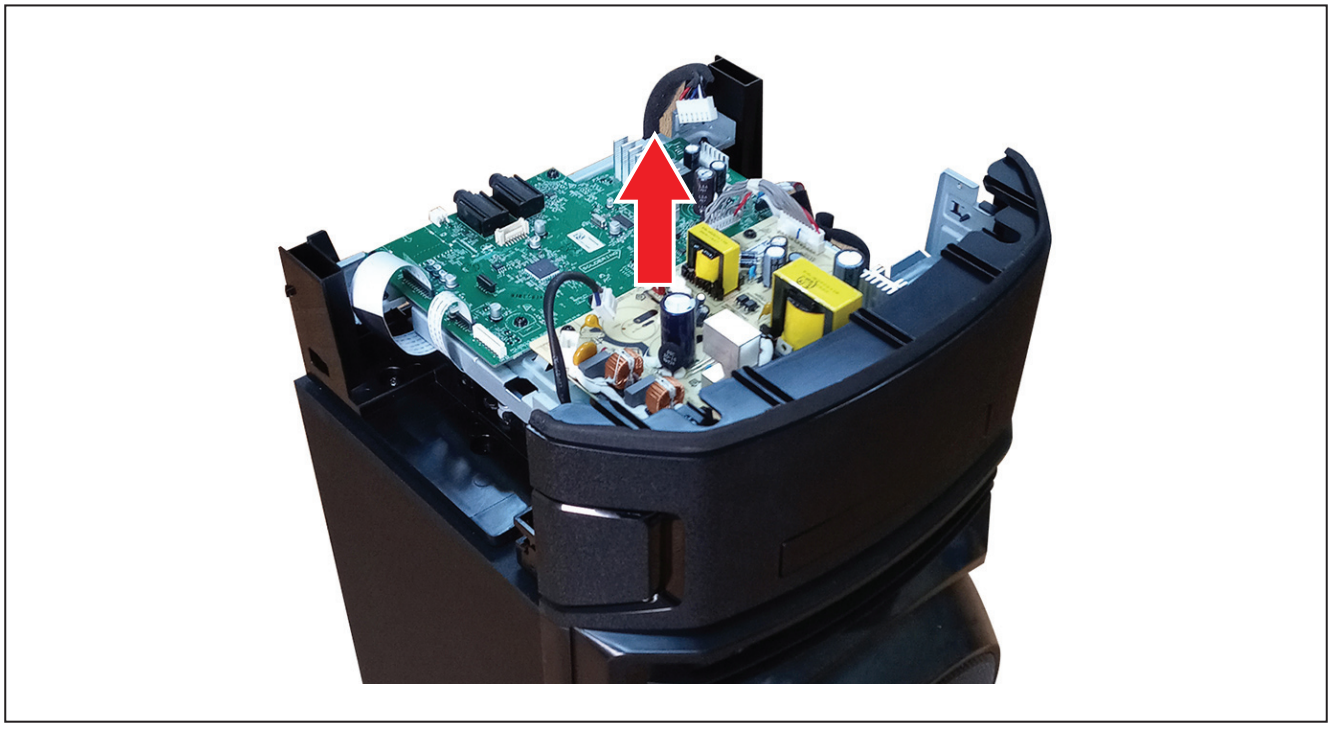


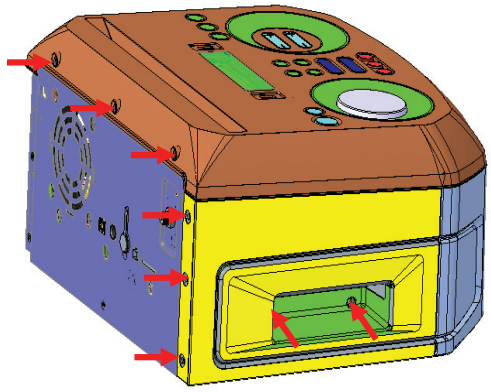
Figure 11. Main Set disassembly - 4

12) Complete removal of the Main Set.

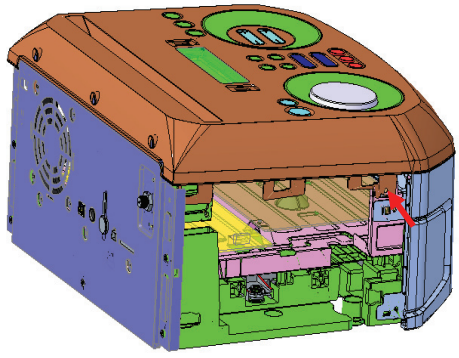
Figure 12. After detaching the Main Set

1. HOW TO DISASSEMBLE THE TOP PANEL

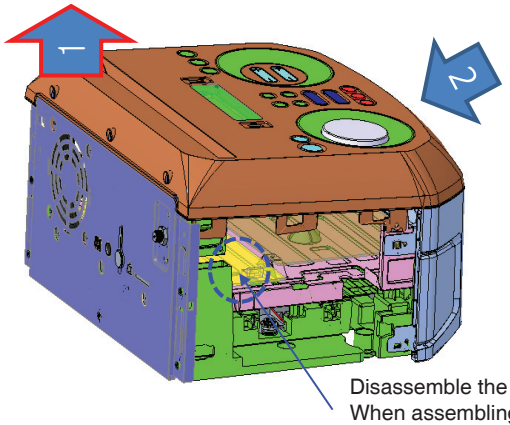
1) Remove the 13 screws on the left and right of the back.

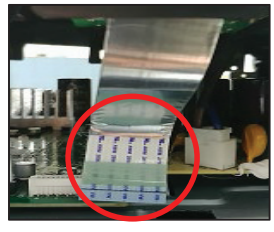


2) Remove the side cover and remove the 2 screws on the left and right.



3) If you lift the top panel slightly with a rubber mallet or palm while lifting the back panel slightly, you can disassemble it without damaging the hook.

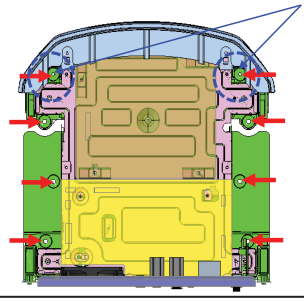




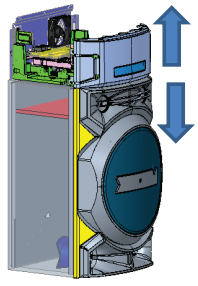
Disassemble the FFC cable before disassembling the top cover.
When assembling the top cover, connect the FFC cable after assembling.

2. HOW TO DISASSEMBLE THE FRONT PANEL

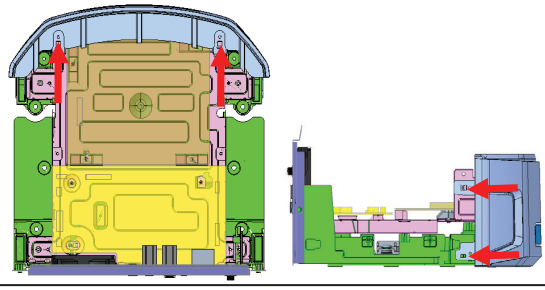
1) Remove the 8 screws with the side cover and the top panel removed.



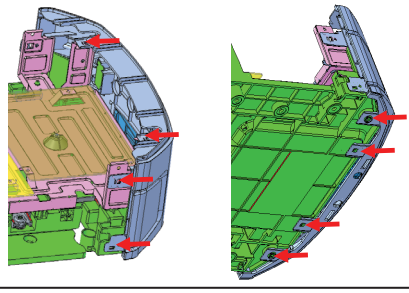
2) Remove the 8 screws to separate the speaker and the set part.



3) Remove the 2 top screws and 4 left and right screws.



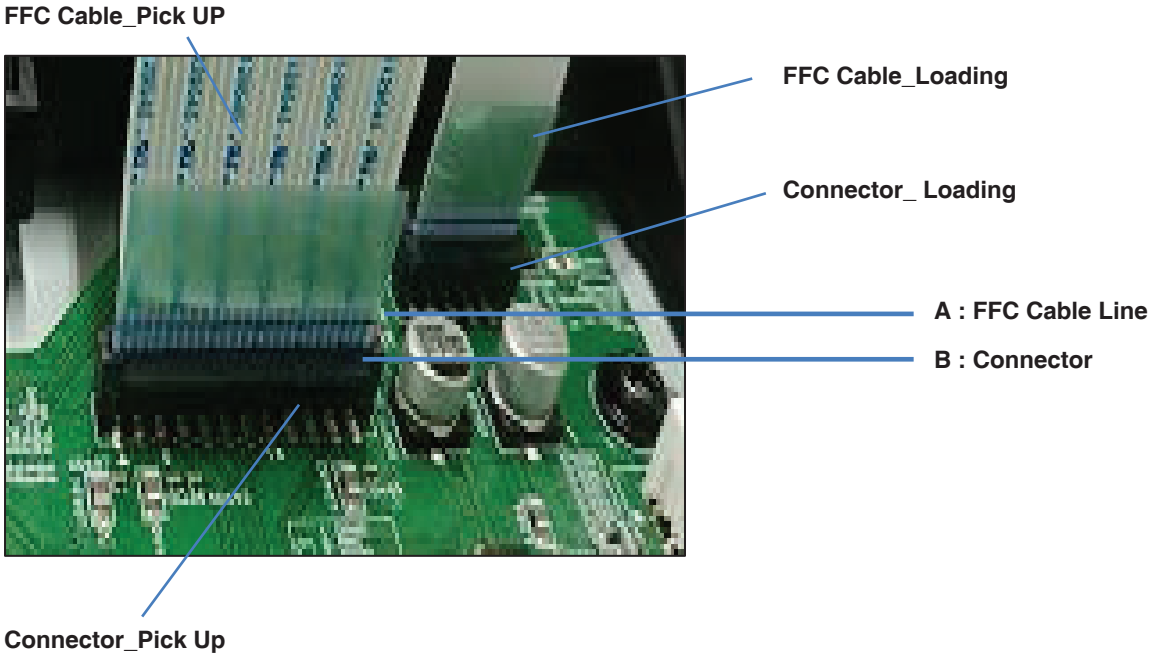
4) You can remove the front panel by releasing the upper 2 hooks and the 4 left and right hooks and releasing the lower 4 hooks.

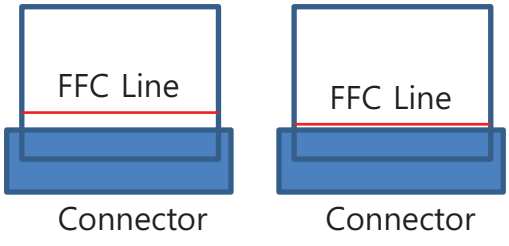


MD FFC INSERTION GUIDE

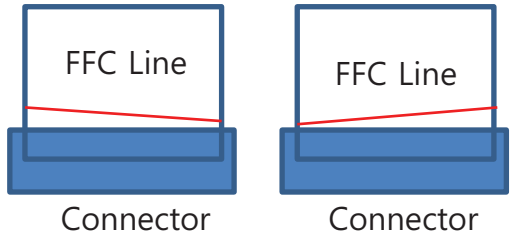
1. Insert FFC Cable_Pick Up into Connector_Pick Up until it is no longer inserted vertically.
   (Also, insert FFC Cable_Loading into Connector_Pick Up with the same disinfection.)

2. Insert as shown in 1 and check the FFC Cable Line level of A based on B.
   (A and B do not always match.)





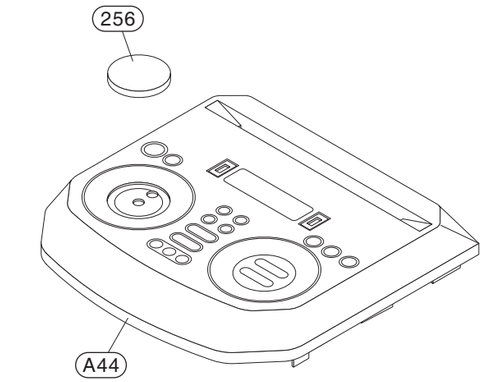
Case 1 : OK

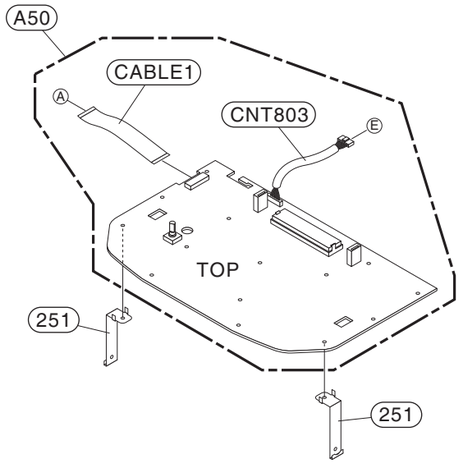


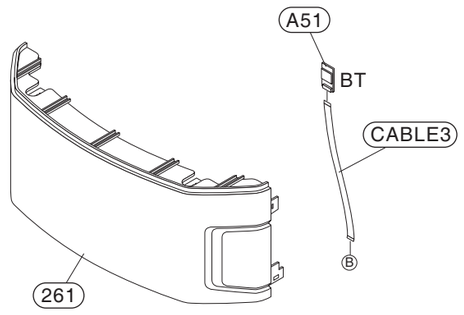
Case 2 : NG

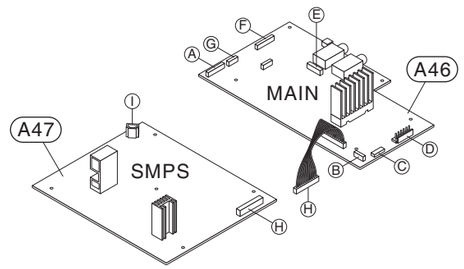
EXPLODED VIEWS

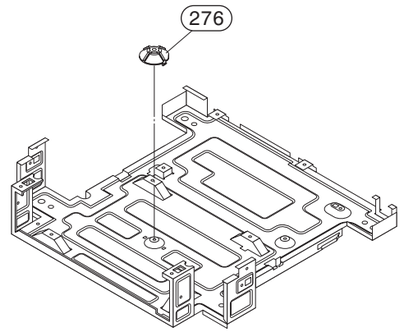
1. CABINET AND MAIN FRAME SECTION

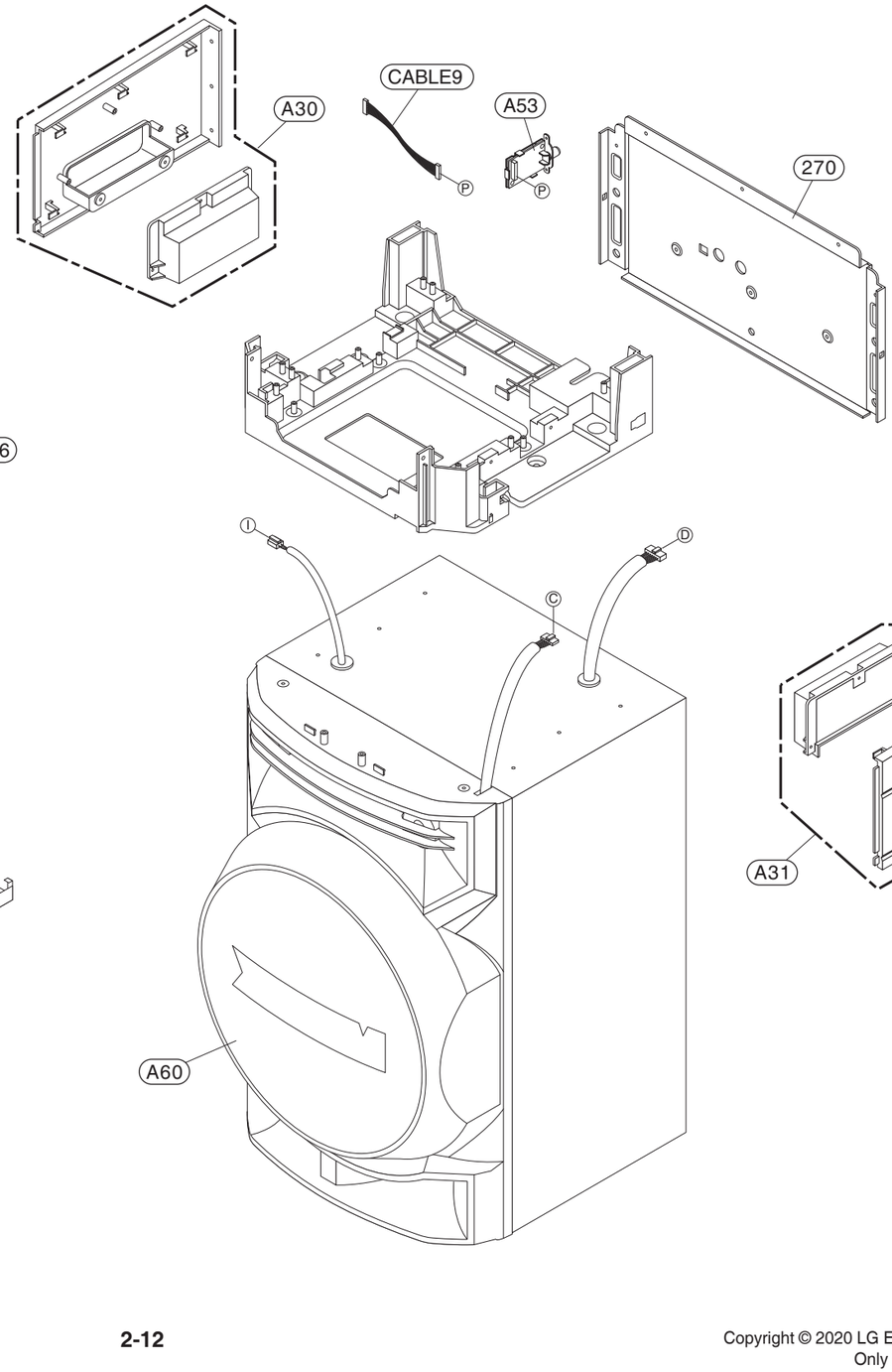


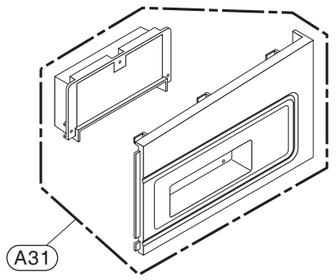












• Cabinet and main frame parts list

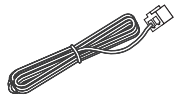
S	AL	LOCA. NO.	PART NO.	DESCRIPTION	SPECIFICATION	REMARKS
ASSEMBLY PARTS						
		A30	ACQ30004902	Cover Assembly	HOME OM9 COVER SIDE ASSY_L_Reg	
		A31	ACQ30004801	Cover Assembly	HOME OM9 COVER SIDE ASSY_R	
		A44	ACQ30004504	Cover Assembly	HOME RN9/7/5 COVER TOP ASSY(RD	
		A46	EBR30169509	Option Code Assembly	91 13 05 26 25 00 00 52 4E 35	
		A47	EBR30795404	PCB Assembly,Power	ON5/RN5 Wide / Standard SMPS T	
		A50	EBR89579701	PCB Assembly	ON9/7/5 Top PCB Total	
		A51	EAT62833604	Module,Bluetooth	MB8811C1TN CSR8811 Argentina H	
		A53	EBR30137501	PCB Assembly	DAB_Module OM9/OM7/RM7/OM5/RM5 only EU EVENT -	
		A60	AAX76967601	Board Assembly	SPK OM5 PANEL + WOOD ASSY	
INDIVISUAL PARTS						
		251	MGJ66911201	Plate,Ground	PRESS SUS 0.3 TOP PCB	
		256	MEY65334201	Knob	MOLD ABS H-121H HOME RM7C MOLD	
		261	AGL30003901	Panel Assembly,Front	HOME RM9/7/5 SET_PANEL FRONT A	
		270	MGC66105566	Panel,Rear	PRESS SECC 0.8 HOME RN5 PRESS	
		276	MEG63540502	Holder	MOLD ABS HOME MINI/Onebody MOL	
CABLES						
		CABLE1	EAD60718903	Cable,FFC	16P125D-H02-1F01A-N 140 140MM	
		CABLE3	EAD62130037	Cable,FFC	10P010D-H2-1F00A-T-200-0-0-0-0	
		CABLE9	EAD65648201	Harness,Single	12507WS-H12G to 12507WS-H12G 80mm	
		CNT803	EAD42004424	Harness,Single	HS-LG16-020 12005HOO-08PL 2200	

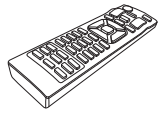
MEMO

2. PACKING ACCESSORY SECTION

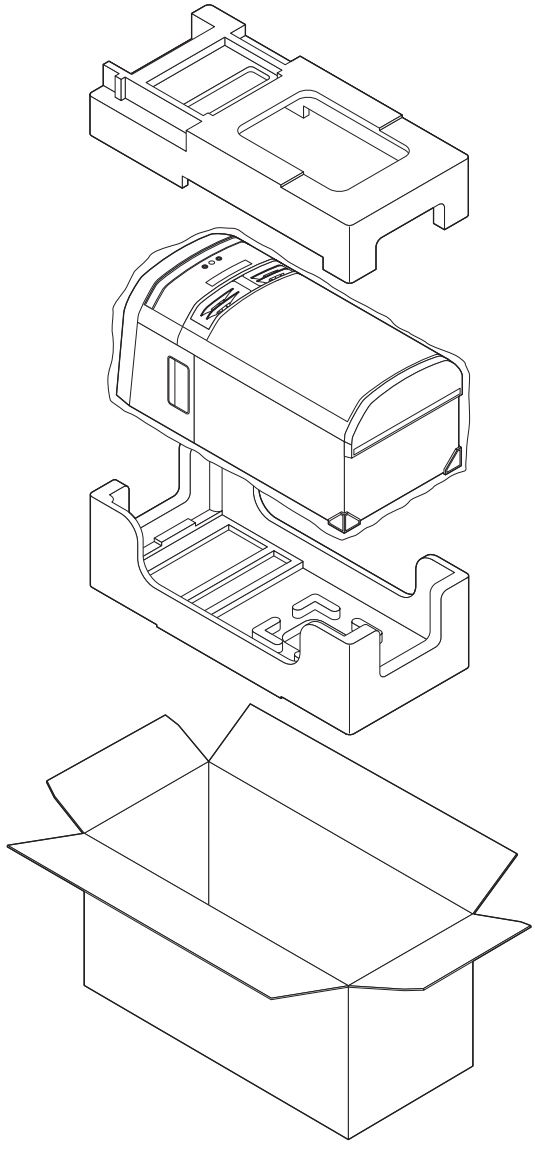
(300) Power Cable

(825) FM Wire Antenna





(900) Remote Control



• Packing accessory parts list

S	AL	LOCA. NO.	PART NO.	DESCRIPTION	SPECIFICATION	REMARKS
⚠		300	EAD64108401	Power Cord	DE-2P-AN-PA-1500-N-00-BK-EU/RU	
		825	EAA65845801	Antenna,T	SN190379 SINGLE 0DB 50OHM 3 1.	
		900	AKB75815318	Remote Controller Assembly	MA2 RM9/7/5 (EU/DAB+) CD MINI	

SECTION 3
ELECTRICAL

CONTENTS

ONE POINT REPAIR GUIDE

1. NO POWER

If the unit doesn't work by no power problem, repair the set according to the following guide.

1-1. FUSE/ THERMISTOR/ BRIDGE DIODE

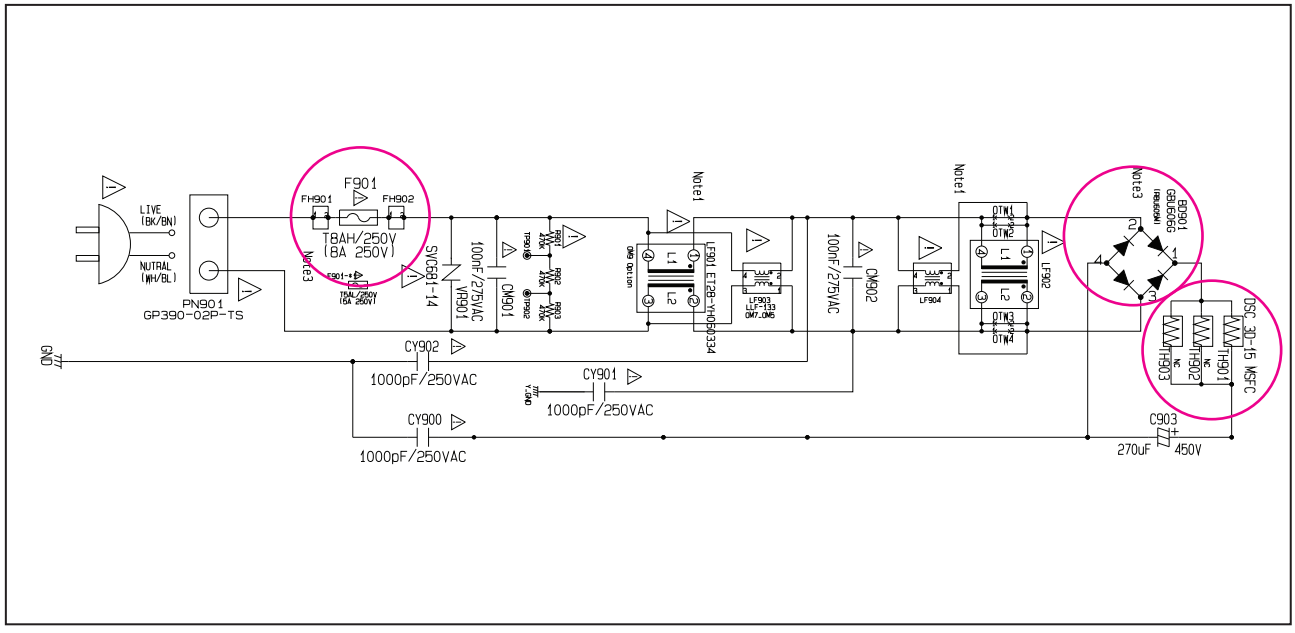
1-1-1. Solution

Please check and replace F901, TH901, BD901 on SMPS board.

1-1-2. How to troubleshoot (Countermeasure)

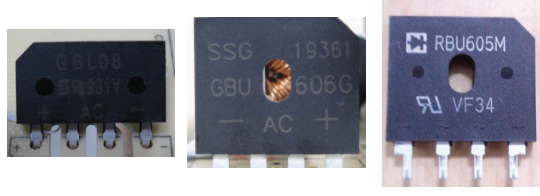
1) Check if the fuse F901 is open or short-circuit.
2) Check if the NTC thermistor TH901 is normal or open.
3) Check if the bridge diode BD901 is short-circuit by over current with a digital multi-meter.

1-1-3. Service hint (Any picture/ Remark)



< F901 >
If F901 is not short-circuit, replace it with a same specifications one.
ON5/ RN5 : 5 A (Red)
ON7/ RN7 : 5 A (Red)
ON9/ RN9 : 8 A (Green)

< TH901 >
If TH901 is open,
replace it with a new one.



< BD901 >
If BD901 is short-circuit,
replace it with a new one.
ON5/ RN5 : GBL08
ON7/ RN7/ ON9/ RN9 : GBU606G or RBU605M

ONE POINT REPAIR GUIDE

NO POWER

If the unit doesn't work by no PVDD problem, repair the set according to the following guide.

1-2. FET

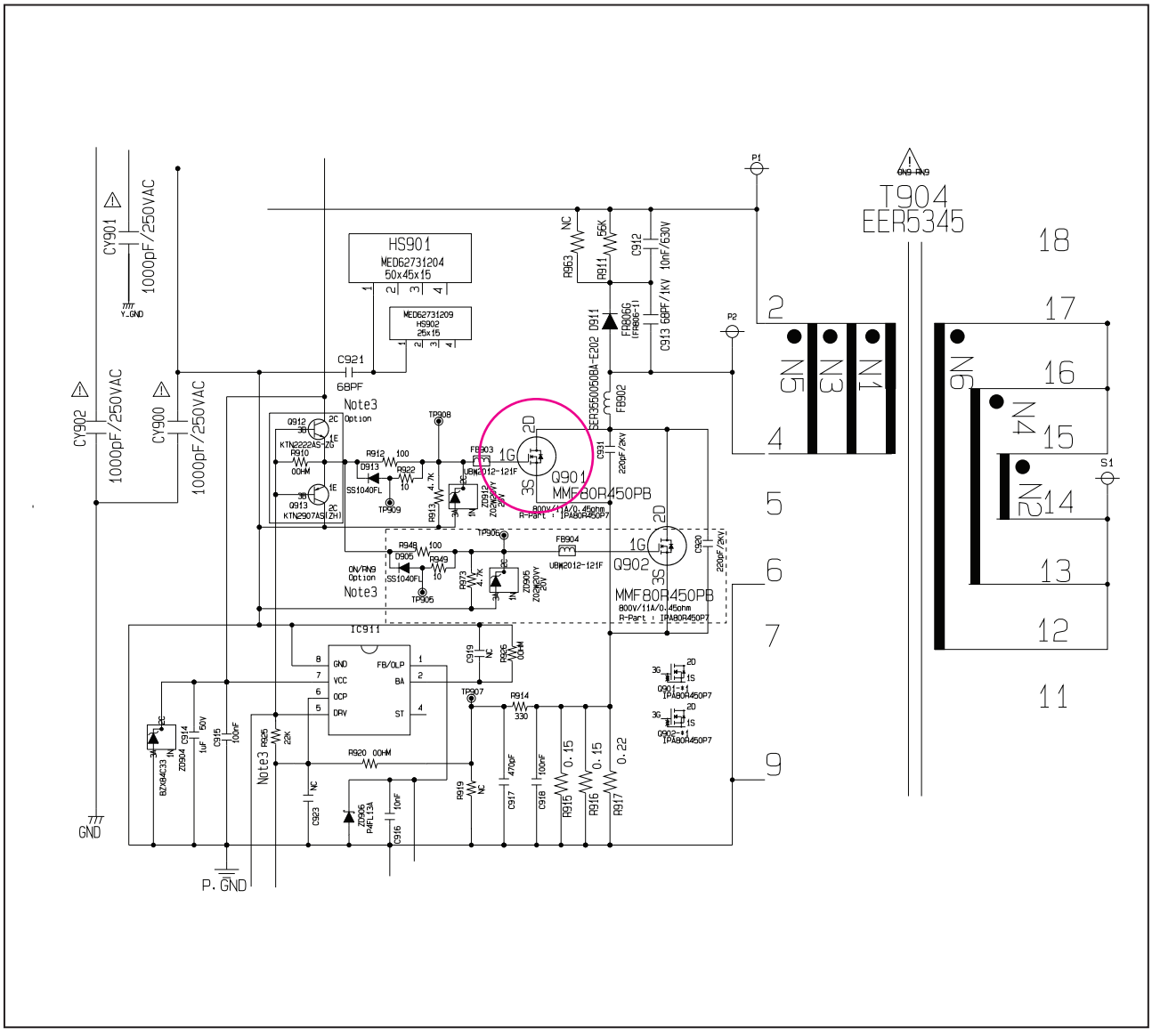
1-2-1. Solution

Please check and replace Q901 on SMPS board.

1-2-2. How to troubleshoot (Countermeasure)

1) Check the Drain-Source or Drain-Gate, Gate-Source Resistance of Q901~ Q902 with a digital multi-meter.
   ⇨ If it is short condition, it's destroyed.
   Replace it with a new one. (Please replace 2 FET at the same time although several FET is OK)
   * RN9 : Q901 + Q902 * RN7/ RN5 : Q901 Only.

1-2-3. Service hint (Any picture/ Remark)



< SMPS circuit >

ONE POINT REPAIR GUIDE

2. NO BOOTING WHEN POWER ON THE SET

The set doesn't work when press the power button on the top board or the remote control.

2-1. IC501

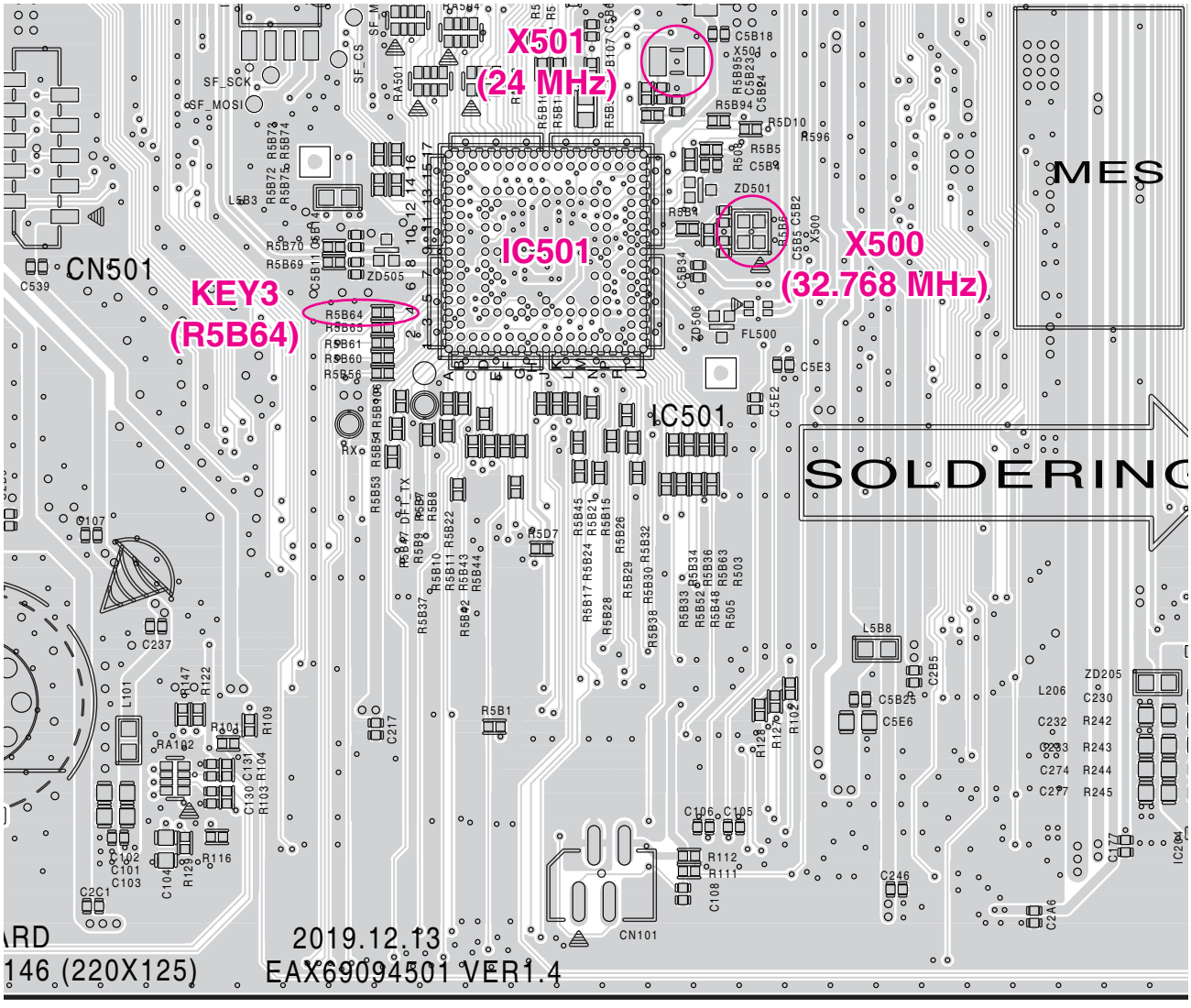
2-1-1. Solution

Replace MAIN board.

2-1-2. How to troubleshoot (Countermeasure)

1) Check the 5.1 VA (CN201) and 3.3 VA(IC202) in standby mode.
   ⇨ If there is no 5.1 VA, check the SMPS and if doesn't appear 3.3 VA, check the IC202.
2) Check +12 V, DVCC_5V and DVCC_3.3V when power on the set.
   ⇨ If the set doesn't work regardless of what the KEY3 changes high to low while pressing the power button. X500 and X501 work normally but, if you can not power on the set, replace the IC501 with a new one on the main board.

2-1-3. Service hint (Any picture / Remark)



< MAIN board top view >

ONE POINT REPAIR GUIDE

3. VFD IS NOT DISPLAYED WHEN POWER ON THE SET

When power on the set, any icons or characters on VFD are not displayed.

3-1. VFD (VFD801)

3-1-1. Solution

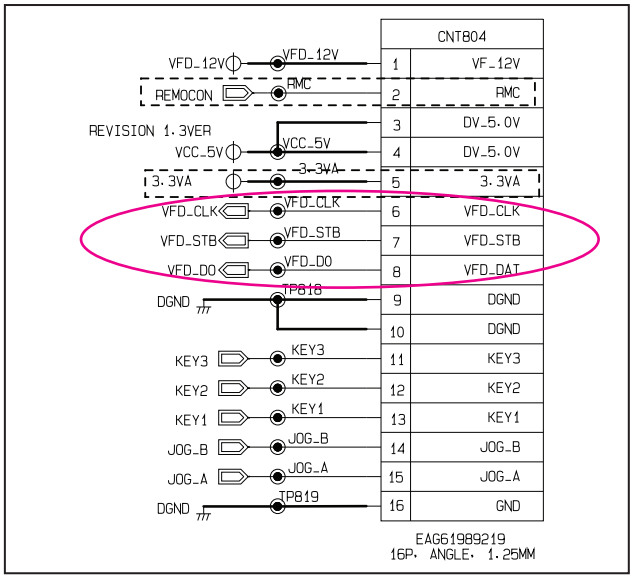
Replace TOP board.

3-1-2. How to troubleshoot (Countermeasure)

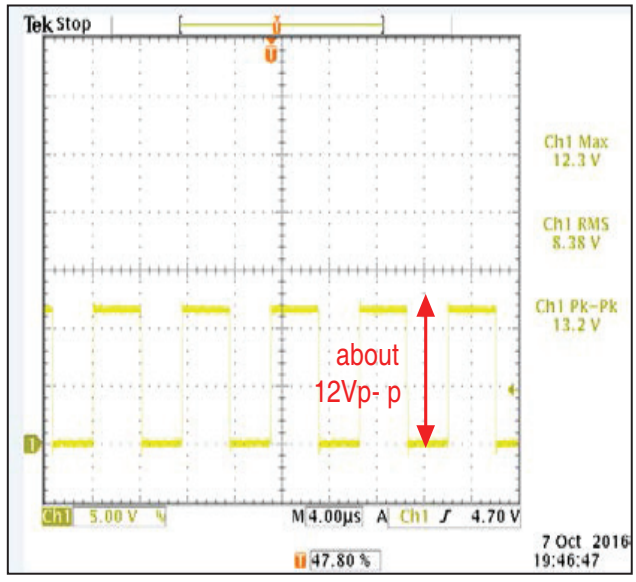
1) Check if VFD_12V, DVCC_3.3V and DV_5V are output from MAIN to VFD via the TOP board.
2) Check if the IC501 outputs VFD_CLK, VFD_STB, and VFD_DO to the TOP board(CNT804 pin6~8).
3) Check if the VFD grid current amplifier circuit on the TOP board.
   Check the drive signal to the transistor's(CNT804 pin6~8) base.
   ⇨ If the control signals from VFD (SW) isn't output, replace VFD with a new one.

VFD heat rays is RED : DVCC_5V(IC201 check) Voltage will be high than 5.5 V.
No VFD : VH(VFD801 pin27) will be not supply about 30 V.
No VFD : VFD 12 V will be not supply (Check Q205).

3-1-3. Service hint (Any picture / Remark)



< CN804 >



CN804 Base
< Waveform of the grid current driver>

ONE POINT REPAIR GUIDE

4. NO BOOTING IN USB FUNCTION

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-1. NO DVCC_3.3V, 1.2 VA

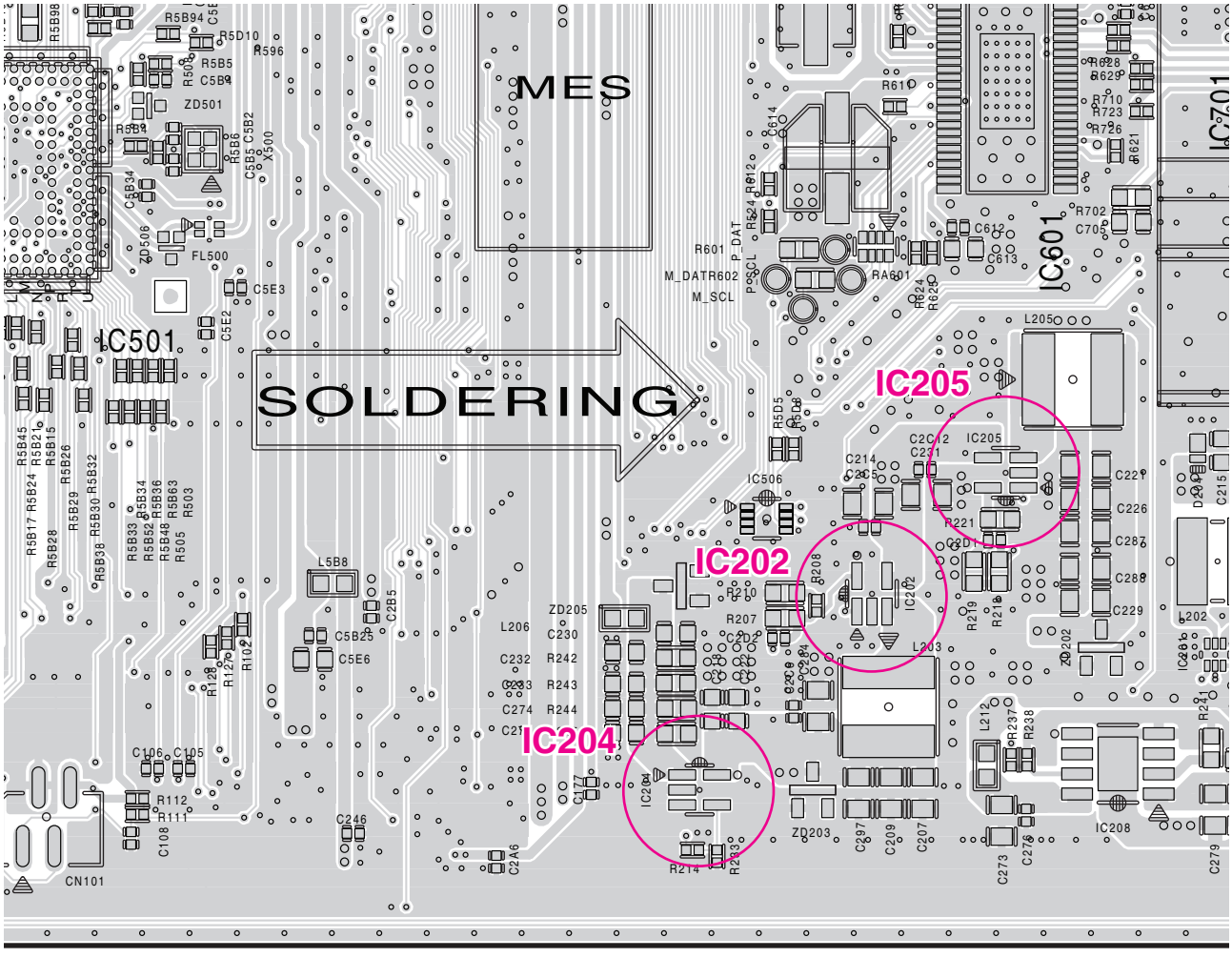
4-1-1. Solution

Replace MAIN board.

4-1-2. How to troubleshoot (Countermeasure)

1) Check voltage of IC202 AND IC205 pin4 on MAIN board.
   ⇨ If IC202, IC205 pin4(about 5.1 V) Input 5.1 VA doesn't come out, check 5.1 VA from SMPS board.
2) If IC202, IC205 pin4(about 5.1 V) is normal, check the PWR_CTRL(IC204 pin5) is high (about 3.3 V).
   ⇨ If PWR_CTRL isn't high, check pin D11 of IC501 & R5B78, R214, R233.
3) If PWR_CTRL is high, check R5B78 and if there's no defective component then check IC204 pin1 short with GND.
4) If 3.3 V(DVCC_3.3V) is normal, check 1.2 VA output(C221, C226, C287, C288, C229) voltage of IC205.
   ⇨ If 1.2 VA of IC205 doesn't come out, then replace IC205.

4-1-3. Service hint (Any picture / Remark)



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO BOOTING IN USB FUNCTION

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-2. CRYSTAL (X500)

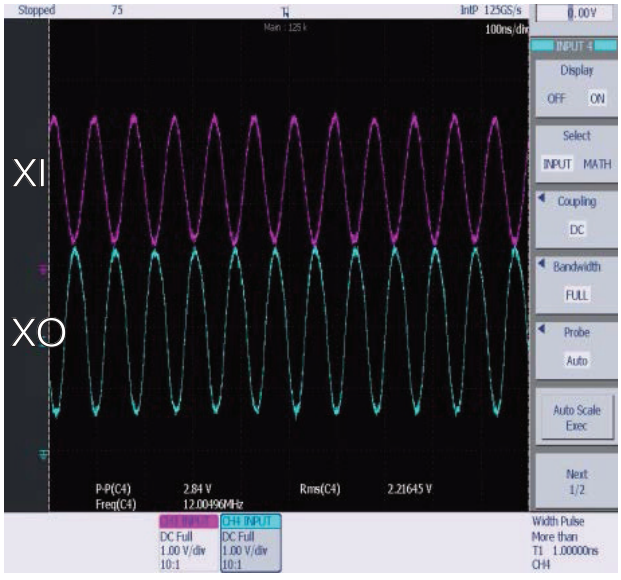
4-2-1. Solution

Replace MAIN board.

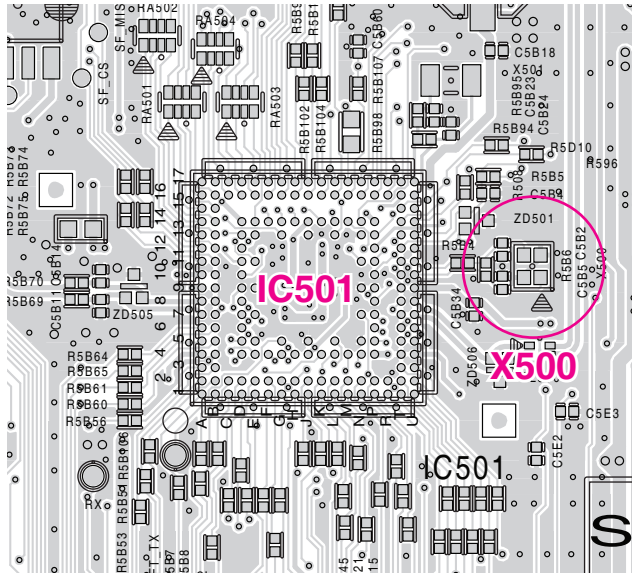
4-2-2. How to troubleshoot (Countermeasure)

1) If 3.3 V & 1.2 V is normal, check reset 'High' of IC501 pin T12 on MAIN board.
   ⇨ If CHIP_RESET isn't high, check the IC505.
2) If CHIP_RESET is high, check the soldering status of 24 MHz crystal (X500).
3) If the crystal(X500) doesn't oscillate, check R5B4, R5B6, C5B2, C5B5 around crystal(X500).
   ⇨ If there's no defective component, then replace X500.

4-2-3. Service hint (Any picture / Remark)



X500
< Signal waveform >



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO BOOTING IN USB FUNCTION

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-3. SERIAL FLASH (IC503)

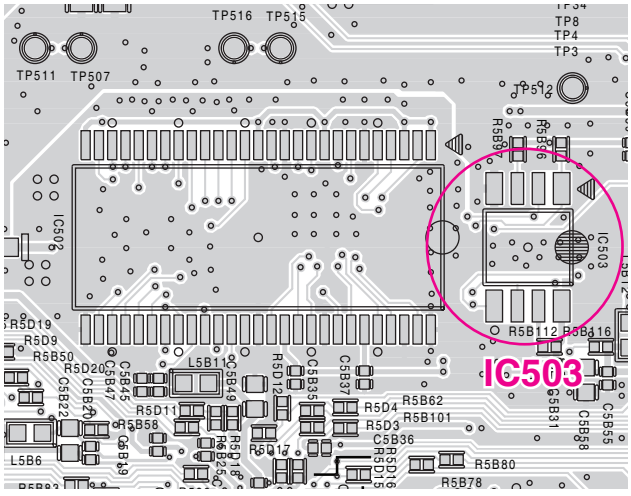
4-3-1. Solution

Replace MAIN board.

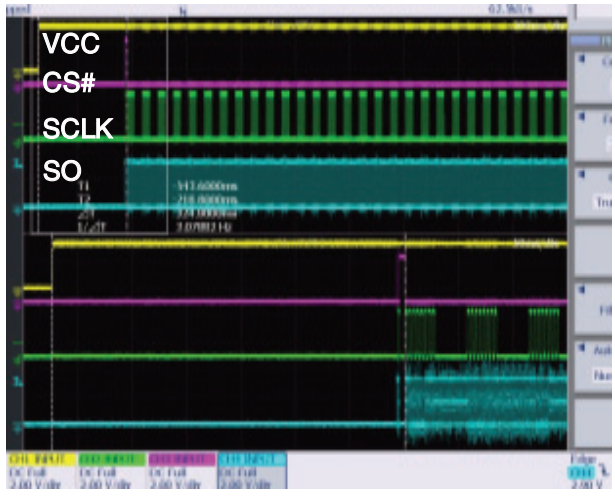
4-3-2. How to troubleshoot (Countermeasure)

1) If the crystal(X500) does oscillate, check Serial Flash(IC503) on MAIN board.
   ⇨ Check pin8(VCC), pin6(SCLK), pin1(CS), pin2(DO), pin5(DI) of below waveform.
2) If pin8, 6, 1, 2, 5 doesn't come out, check damping resistor(R5B72, R5B73, R5B74, R5B75) of IC503.
   ⇨ If damping resistor of IC503 is OK, then replace IC503. (it need to download program)
3) After change IC503, if It is still not below waveform, check IC501(DSP IC).

4-3-3. Service hint (Any picture / Remark)



< MAIN board bottom view >



< Signal waveform >

ONE POINT REPAIR GUIDE

NO BOOTING IN USB FUNCTION

After you turn on power key and displayed message in the following order (HELLO ⇨ VOL XX ⇨ USB) on VFD, it will not display other message on VFD, and it will not boot-up normally.

4-4. SDRAM (IC502)

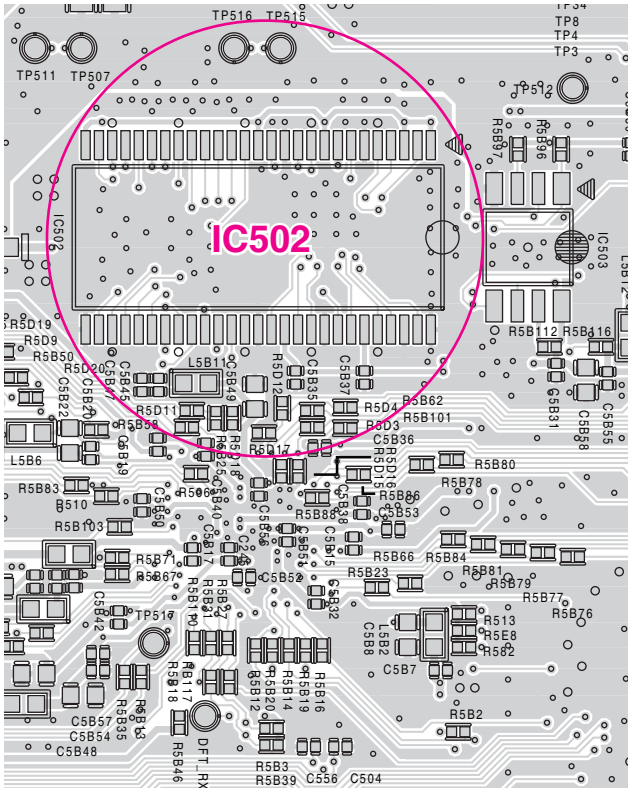
4-4-1. Solution

Replace MAIN board.

4-4-2. How to troubleshoot (Countermeasure)

1) Check below waveform & soldering status of SDRAM (IC502) on MAIN board.
   ⇨ If pin17(#CAS), pin18(#RAS), pin19(#CS), pin38(CLK), pin29(address), pin2(DQ) doesn't come out, check damping resistor ((R5B99, R5B100, R5B102, R5B104, R5B107).
2) If resistor is OK, then replace IC502(SDRAM).
3) After change IC502, if It is still not below waveform, check IC501(DSP IC).

4-4-3. Service hint (Any picture / Remark)



< MAIN board bottom view >

< Signal waveform >

ONE POINT REPAIR GUIDE

5. NO SOUND

There is no sound output by DIGITAL AUDIO AMP DAMAGE, repair the set according to the following guide.

5-1. DIGITAL AUDIO AMP DAMAGE

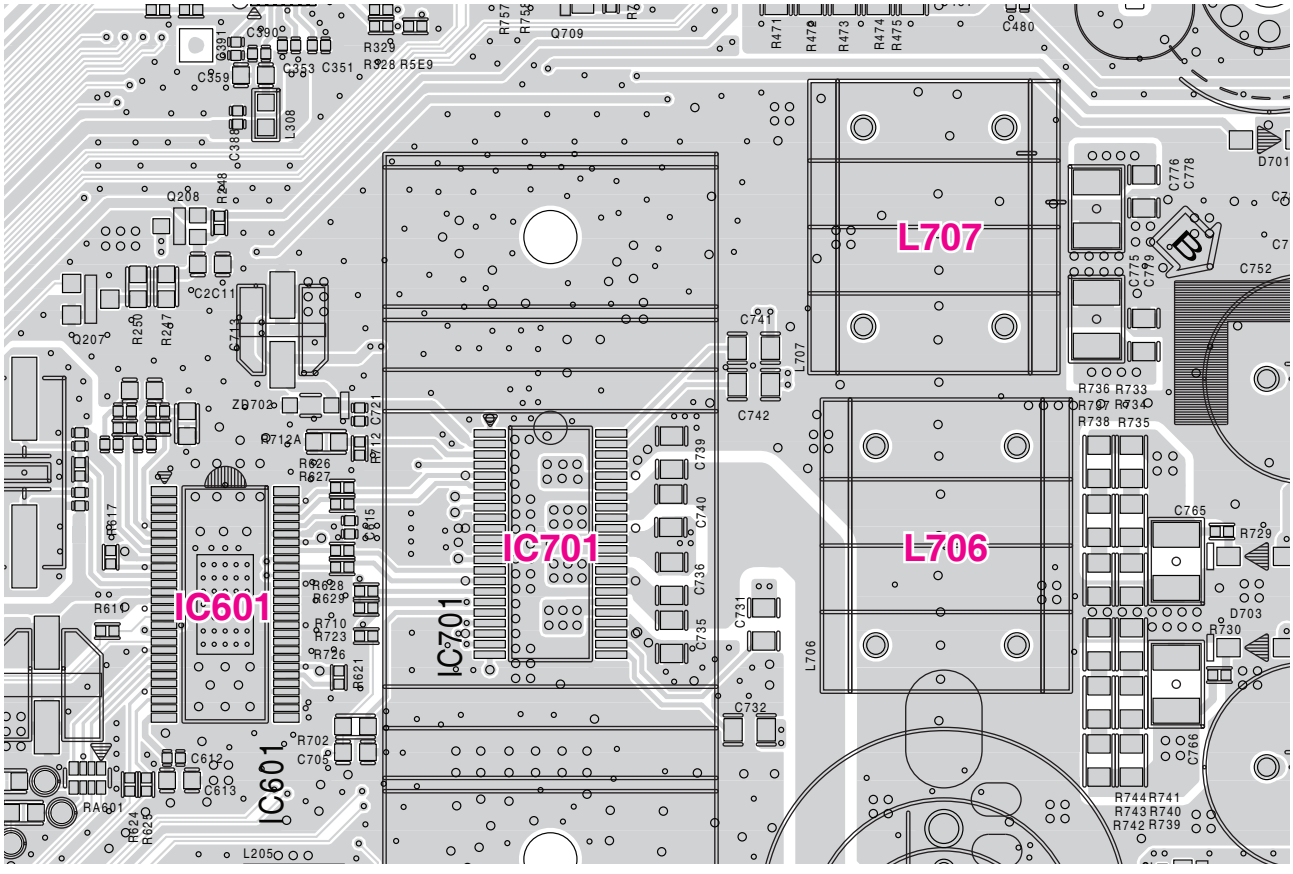
5-1-1. Solution

Replace MAIN board.

5-1-2. How to troubleshoot (Countermeasure)

1) Check PWM_FL±, PWM_FR± & PWM_SW± signals from IC601 to IC701 & 702 each input function.
   ⇨ If no signal, check if I2S audio signals are entered to IC601.
2) Check PVDD.
   ⇨ If PVDD is abnormal, check the SMPS.
3) Check AMP_12V for driving the gate of AMP IC.
   a. All the powers are normal, but if AMP_12V is low, there is possible for AMP IC to be damaged.
   b. Remove L706, L707 one by one.
      When removed a inductance, if AMP_12V is recovered, the IC connected to it was damaged.
   c. Replace the IC with a new one.
4) Check the impedance between IC701_OUT_A/OUT_B & GND.
   a. If the impedance is 0 Ω, the IC must be damaged.
   b. After removing the heat sink, replace it with a new one.

5-1-3. Service hint (Any picture/ Remark)



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the USB Function, repair the set according to the following guide.

5-2. USB FUNCTION

5-2-1. Solution

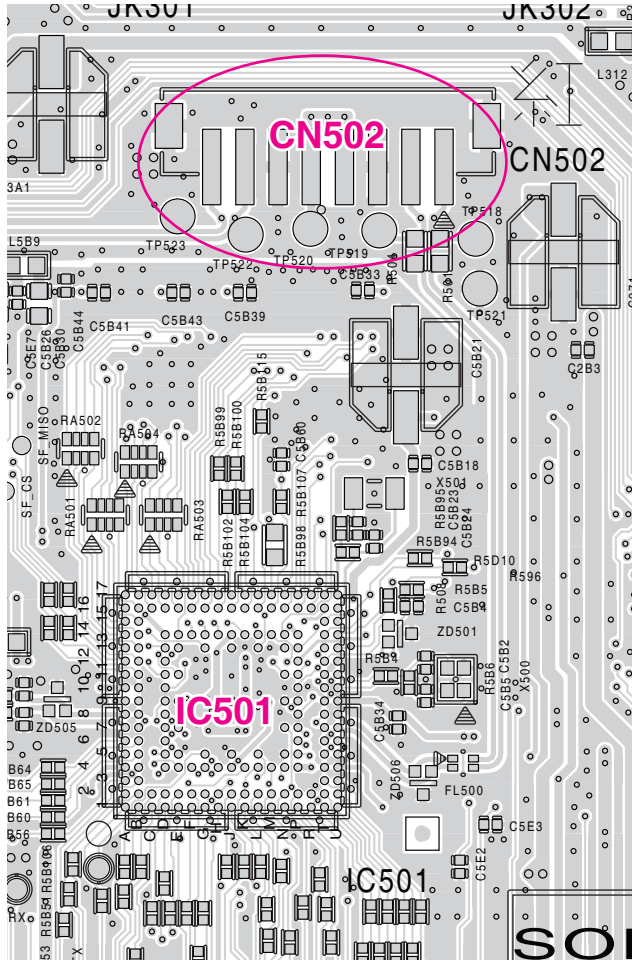
Replace MAIN board.

5-2-2. How to troubleshoot (Countermeasure)

1) Check +5V_USB to USB board.
   ⇨ If the Character 'USB 1' or 'USB 2' is turned on VFD, the voltage is okay, if so not, check USB_5V to pin4, 5 of CN502.
2) Check USB D1± or USB D2± from MAIN board to TOP board.
   a. Check 2.0_D1±signals(pin U7, U8) or 1.1_D1± signals(pin A7, A8) to IC501.
   b. Check USB± signals to CN502(pin1, 2, 7, 8).
   ⇨ If there is any trouble, check the power for IC207.
   The power is normal but, if the signal waveform to the IC is distorted or no signal, replace it with a new one.
3) Check if "Digital audio AMP block" on item 6-1 is normal.

5-2-3. Service hint (Any picture/ Remark)

USB D-/D+ (CN502 pin1, 2 & pin7, 8)
< Waveform of USB D± signal >



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the TUNER function, repair the set according to the following guide.

5-3. TUNER FUNCTION

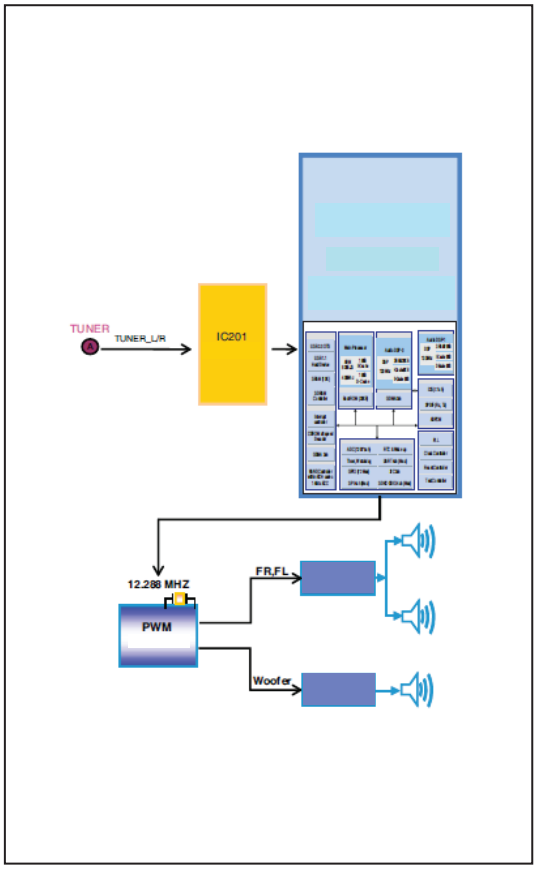
5-3-1. Solution

Replace MAIN board.

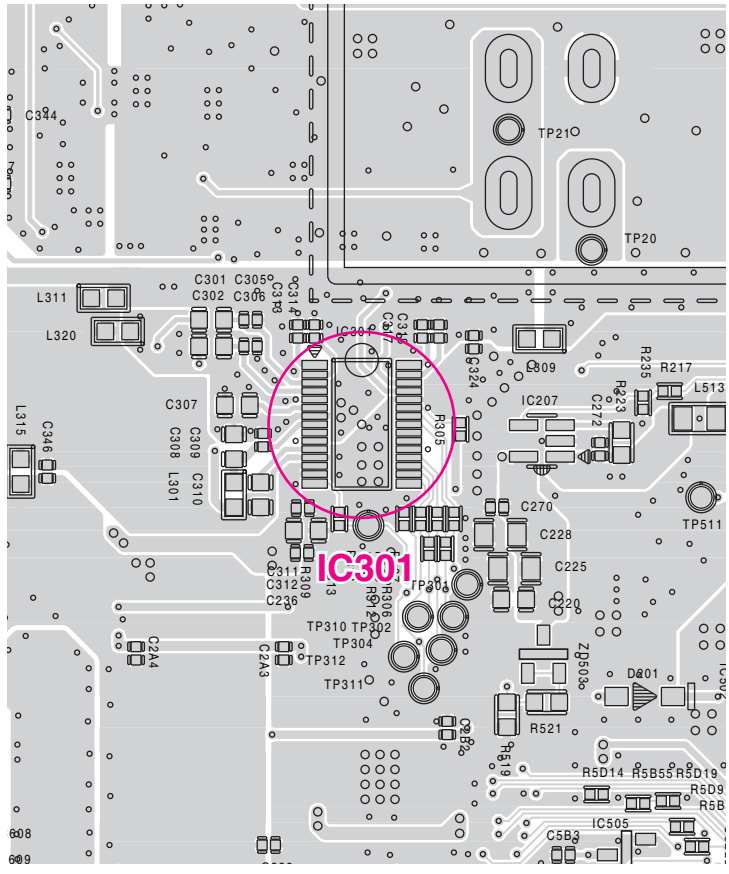
5-3-2. How to troubleshoot (Countermeasure)

1) Check if TUNER_LR is entered from pin13, 14 of IC302 to IC301(pin27, 28)
   ⇨ If no signals, check AVCC_3.3V for tuner power.
   ⇨ Check if the tuner control signals (CLK, DAT, CE, RST, SLT) are entered from IC501 to IC302.
   If it doesn't work, replace IC302 with a new one.
2) Check if MCS_BCK, MCS_LRCK, & MCS_MCLK are entered from IC501 to IC201.
3) Check if ADC_DATA is entered from IC301 to IC501.
   ⇨ If no signal, check AVCC_3.3V & DVCC_3.3V (ADC) for IC301. If is NG, replace it with a new one.
4) Check the following I2S audio signal flow from IC501 to IC601. (Refer to Item 6-2.)
   ⇨ If there is any trouble, check the power for each IC.
   The power is normal but, if the signal waveform to the IC is distorted or no signal,
   replace it with a new one.
5) Check if the digital audio AMP block is okay. Refer to "Digital Audio AMP" guide on Item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

5-3-3. Service hint (Any picture/ Remark)



< TUNER function signal flow >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the MIC IN function, repair the set according to the following guide.

5-4. MIC(Guitar) IN function

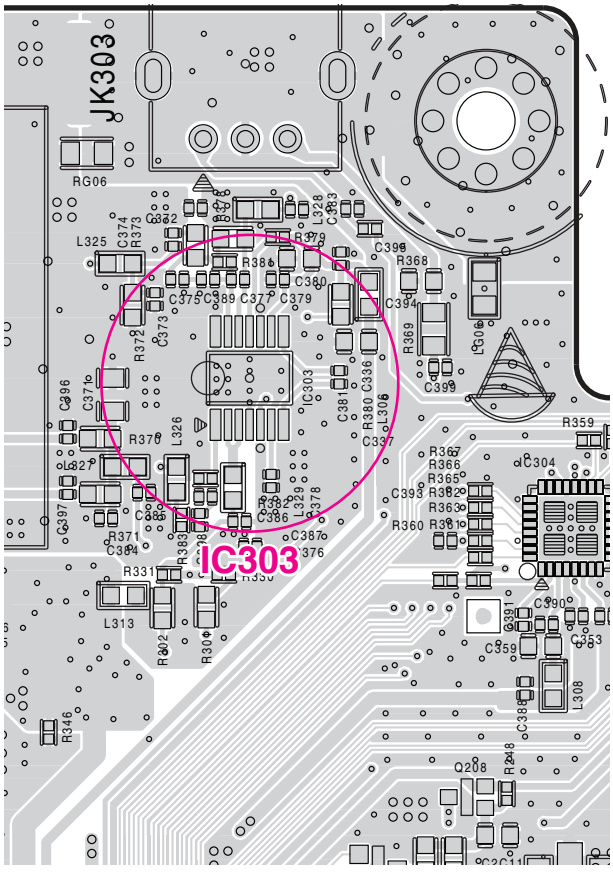
5-4-1. Solution

Replace MAIN board.

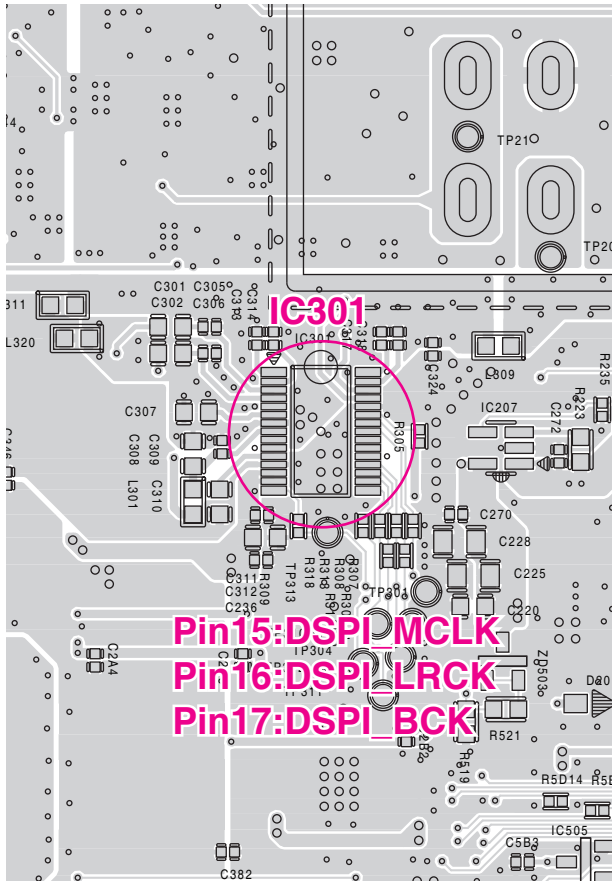
5-4-2. How to troubleshoot (Countermeasure)

1) Check MIC_SI & Guitar signal to pin1, 13 of IC303.
   ⇨ If no signal, Check the signals to pin6 & 8 of CNA301 on the MIC & RMC board.
2) Check if MIC_SIG and GUITAR is input from pin3, 12 of IC303 to pin3, 4 of IC301 .
   ⇨ If no signal output, check MIC_3.3V for IC303, replace IC303 with a new one if it has a problem.
3) Check if DSPI_BCK, LRCK,MCLK are entered from IC501 to IC301.
   Check if MIC_DATA_IN is entered from pin19 of IC301 to pin E4 of IC501.
   ⇨ If no signal, check AVCC_3.3V & DVCC_3.3V for IC301.
   If it is abnormal, change replace it a new one.
4) Check the following I2S signal flow from IC301 to IC501.
   ⇨ If there is any trouble, check the power for each IC.
   If the signals are abnormal, replace it a new one.
5) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

5-4-3. Service hint (Any picture/ Remark)



< MAIN board top view >



< MAIN board bottom view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the Bluetooth function, repair the set according to the following guide.

5-5. BLUETOOTH FUNCTION

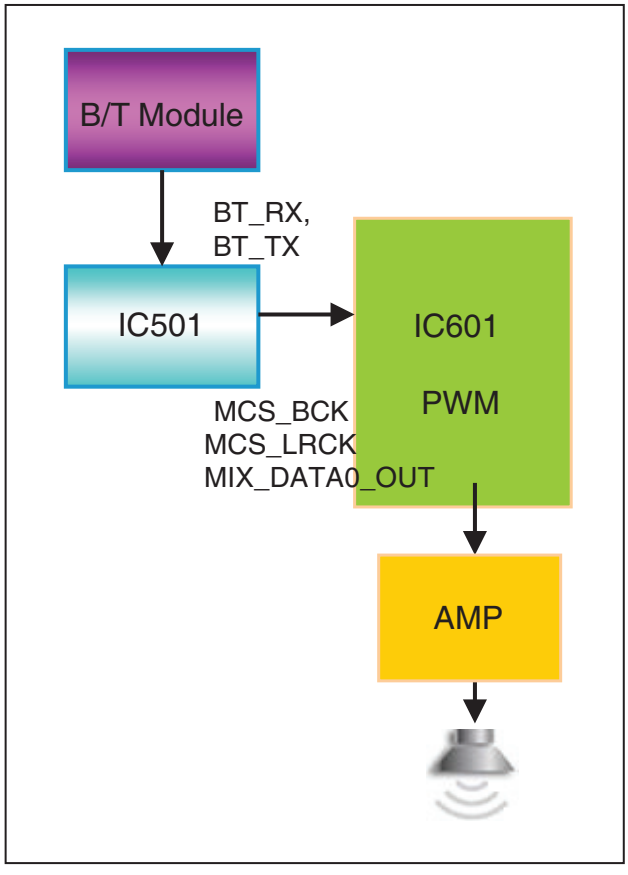
5-5-1. Solution

Replace MAIN board or bluetooth module.

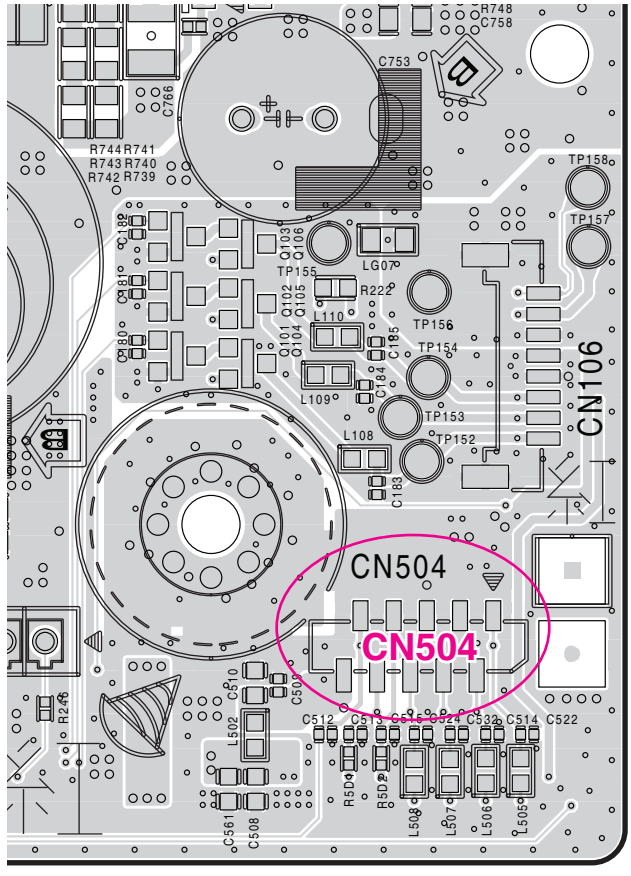
5-5-2. How to troubleshoot (Countermeasure)

1) Check BT_RX, BT_TX signal to pin6, 4 of CN504.
   ⇨ If no signal, check the signal to pin4, 6 and pin10 (3.3 VA) of on the Bluetooth module and cable connection state.
   ⇨ If there are no signal out from module, replace new module.
2) Check if BT_RX/TX is entered from pin6, 4 of CN504 to pin L1,K1 to IC501 (DSP).
3) Check if MCS_BCK, MCS_LRCK & MIX_DATA IN is entered from IC501 to IC601.
   ⇨ If no signal, check +3.3 VA & +1.2 VA for IC501.
   If it is abnormal, change replace it a new one.
4) Check the following I2S signal flow from IC501 to IC601.
   ⇨ If there is any trouble, check the power for each IC.
   If the signals are abnormal, replace it a new one.
5) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

5-5-3. Service hint (Any picture/ Remark)



< Bluetooth function signal flow >



< MAIN board top view >

ONE POINT REPAIR GUIDE

NO SOUND

There is no sound output in the OPTICAL function, repair the set according to the following guide.

5-6. OPTICAL FUNCTION

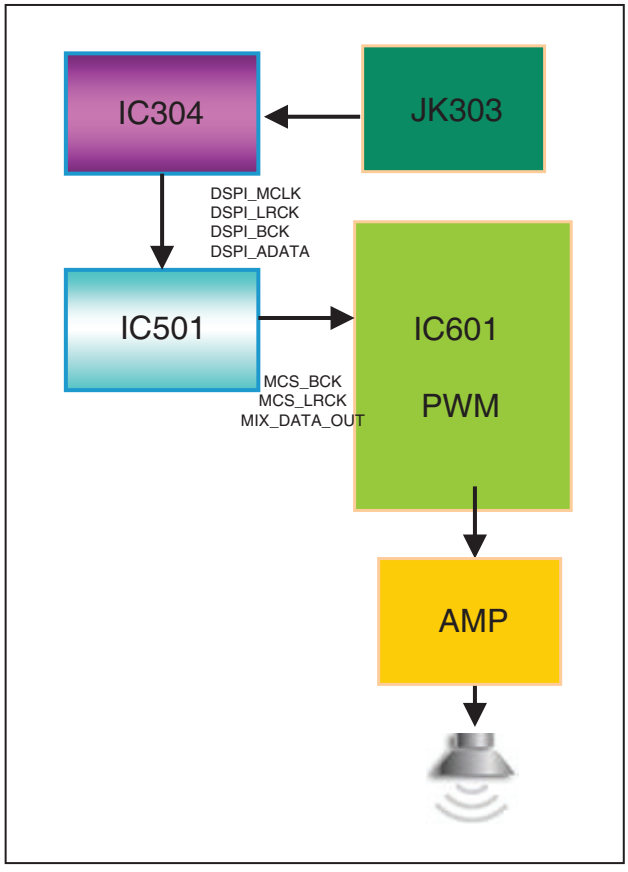
5-6-1. Solution

Replace MAIN board.

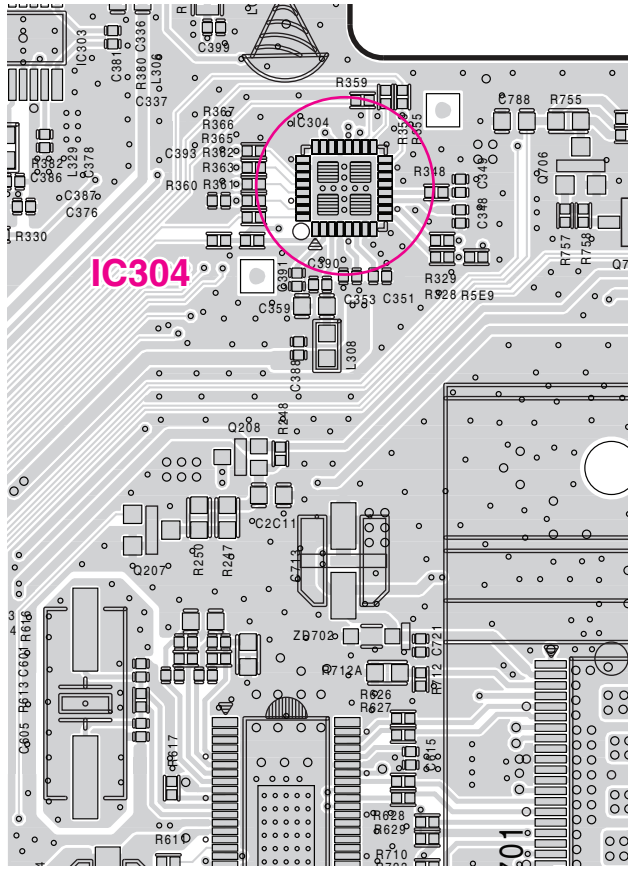
5-6-2. How to troubleshoot (Countermeasure)

1) Check DSPI_BCK, LRCK, MCLK, ADATA of IC304(pin27, 28, 29, 31).
   ⇨ If no signal, check the signal from JK303 pin1 to IC304 pin1 and cable connection state.
   ⇨ If there are no signal out from JK303, replace new connector and cable.
2) Check if MCS_BCK, MCS_LRCK & MIX_DATA IN is entered from IC501 to IC601.
   ⇨ If no signal, check +3.3 VA & +1.2 VA for IC501. If it is abnormal, change replace it a new one.
3) Check the following I2S signal flow from IC501 to IC601.
   ⇨ If there is any trouble, check the power for each IC. If the signals are abnormal, replace it a new one.
4) Check if the digital audio AMP block is okay. Refer to “Digital Audio AMP” guide on item 6-1.
   ⇨ If AMP is damaged, replace it with a new one.

5-6-3. Service hint (Any picture/ Remark)



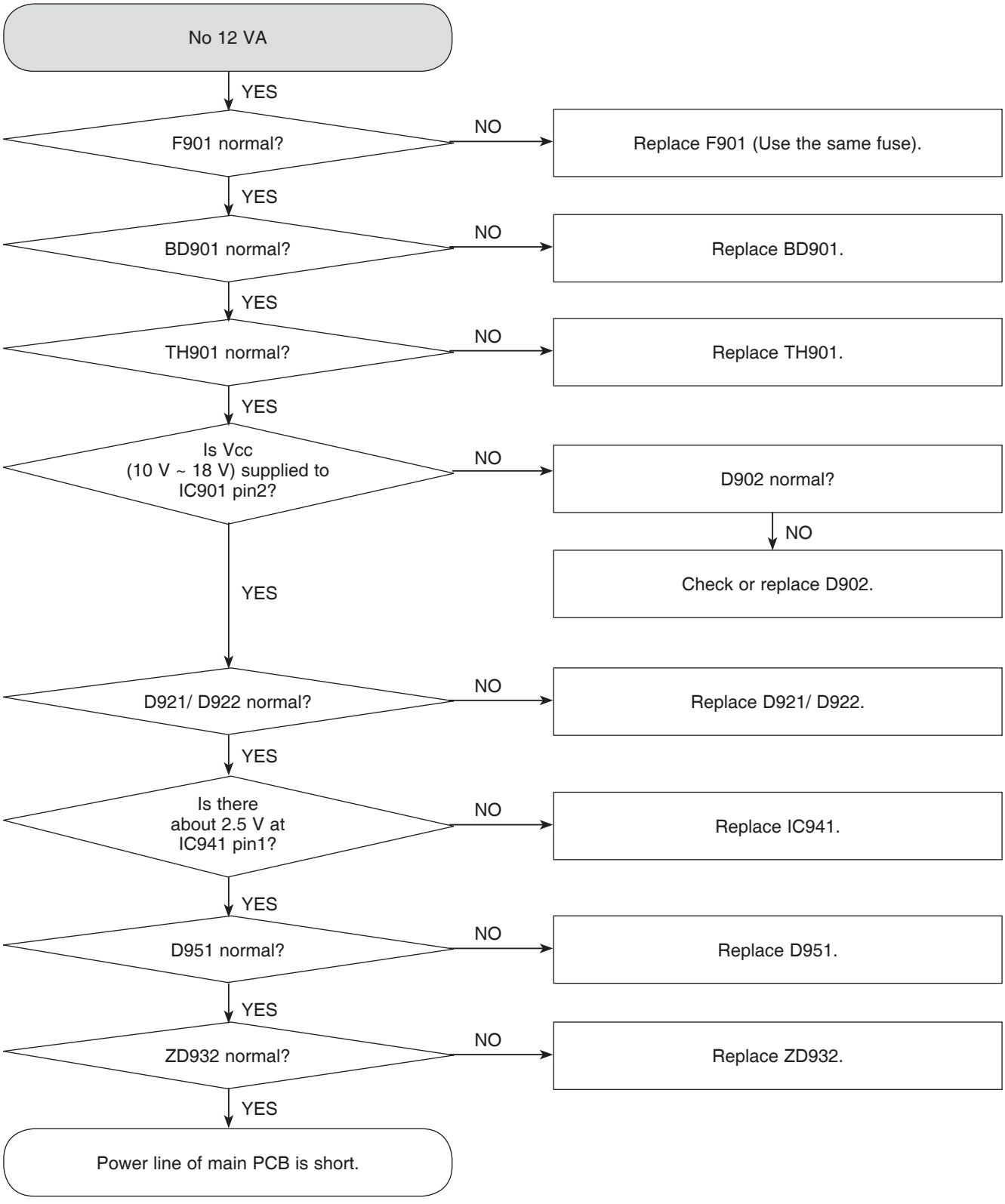
< OPTICAL function signal flow >



< MAIN board top view >

ELECTRICAL TROUBLESHOOTING GUIDE

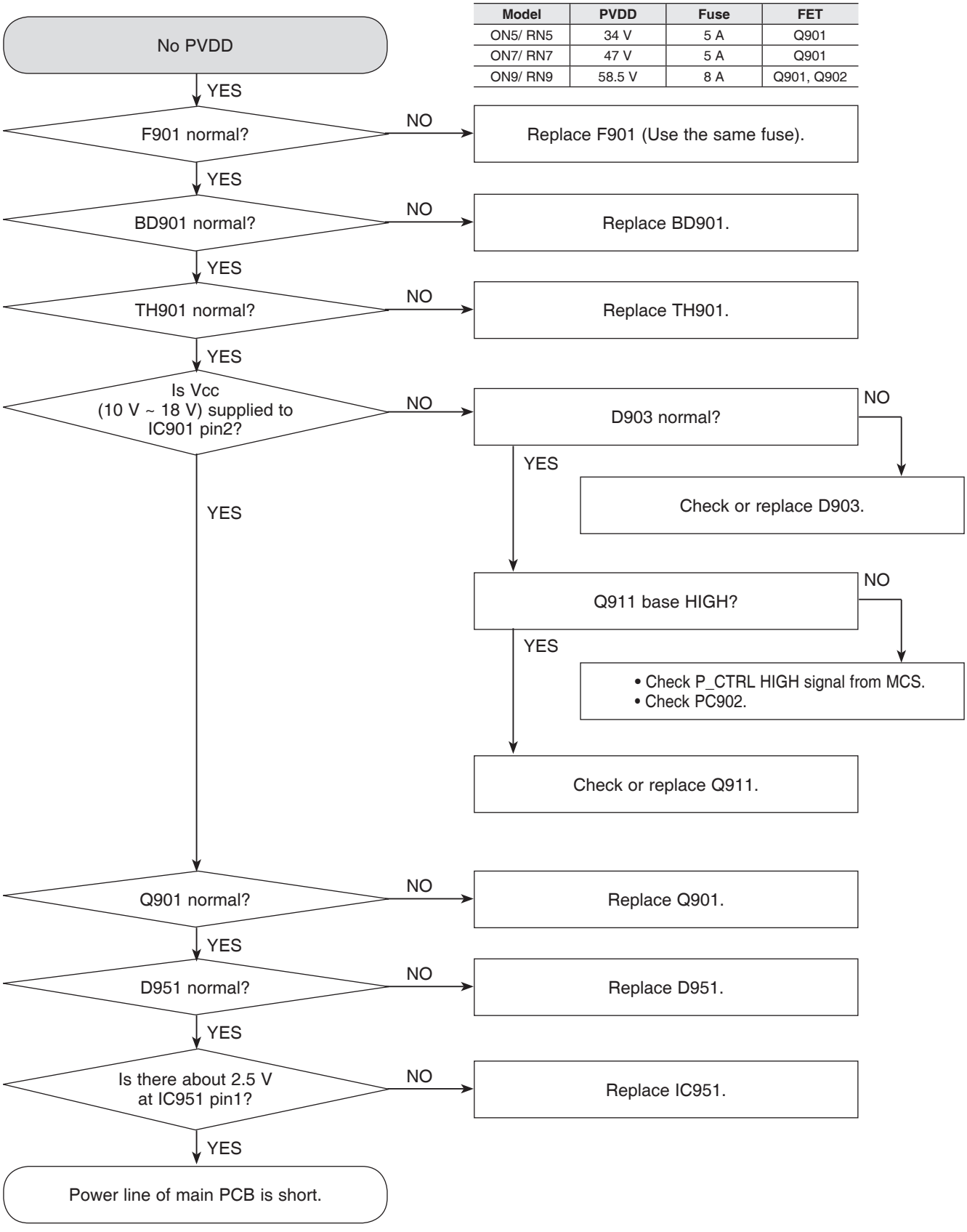
1. POWER (SMPS)



ELECTRICAL TROUBLESHOOTING GUIDE

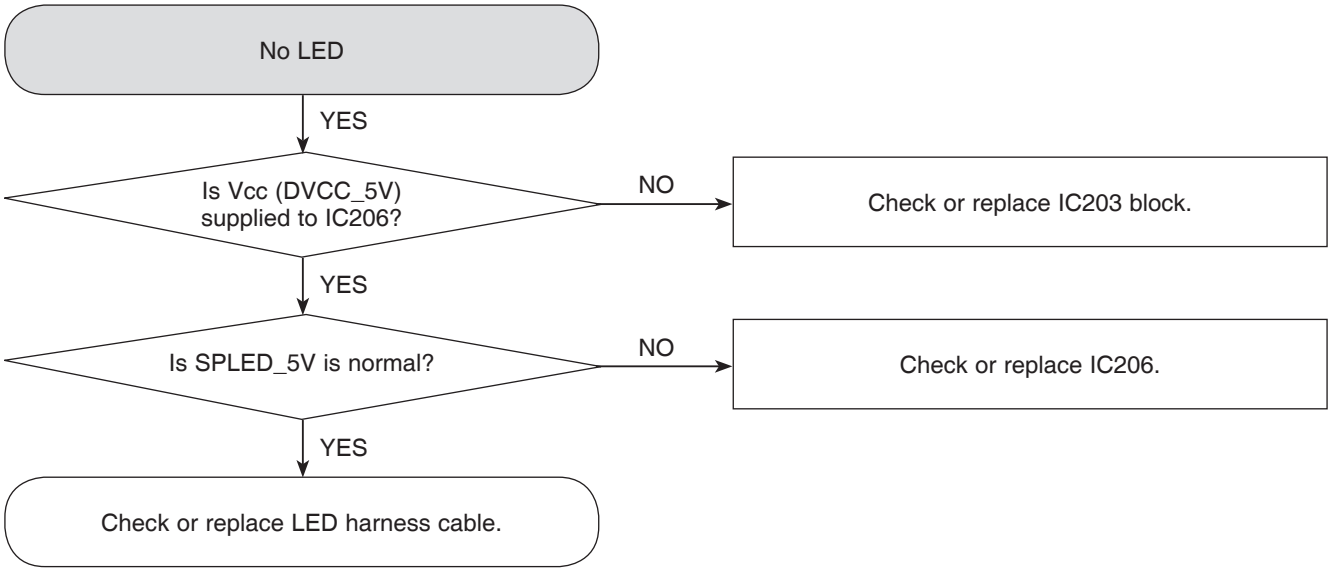
POWER (SMPS)

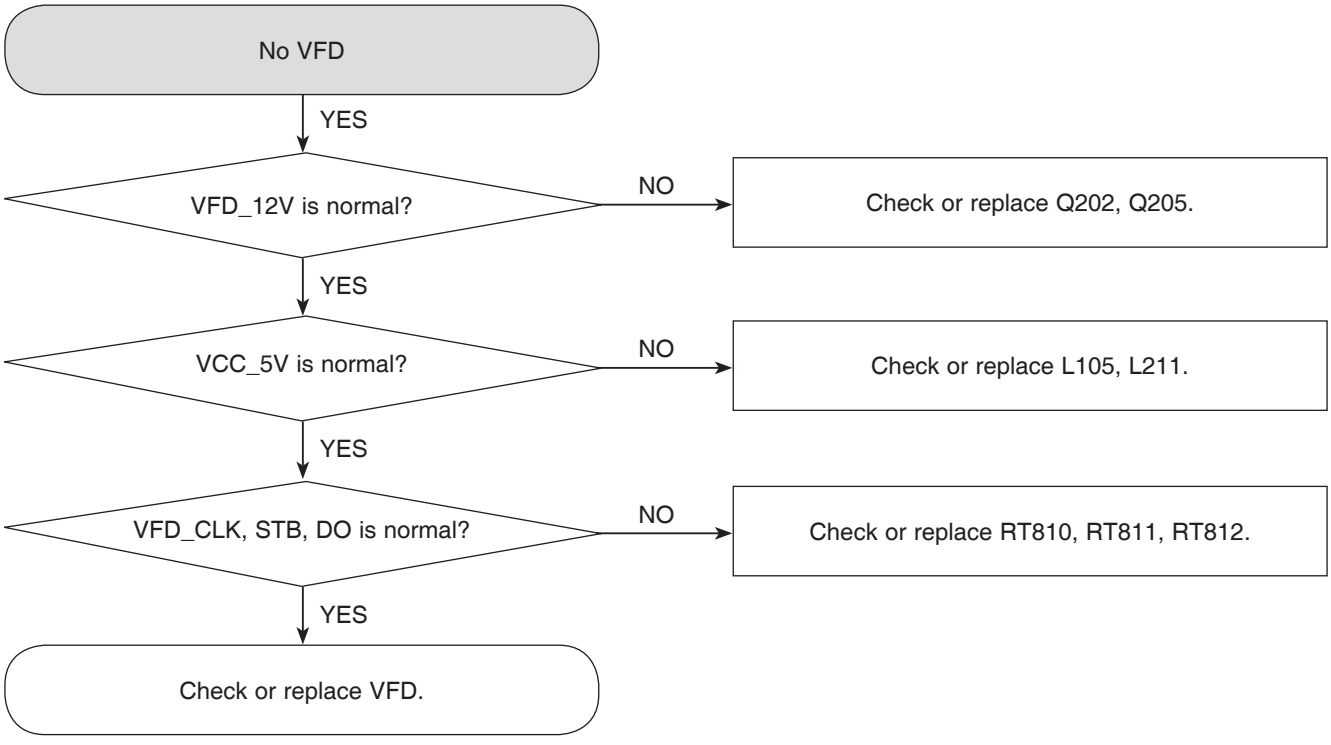
Model	PVDD	Fuse	FET
ON5/ RN5	34 V	5 A	Q901
ON7/ RN7	47 V	5 A	Q901
ON9/ RN9	58.5 V	8 A	Q901, Q902



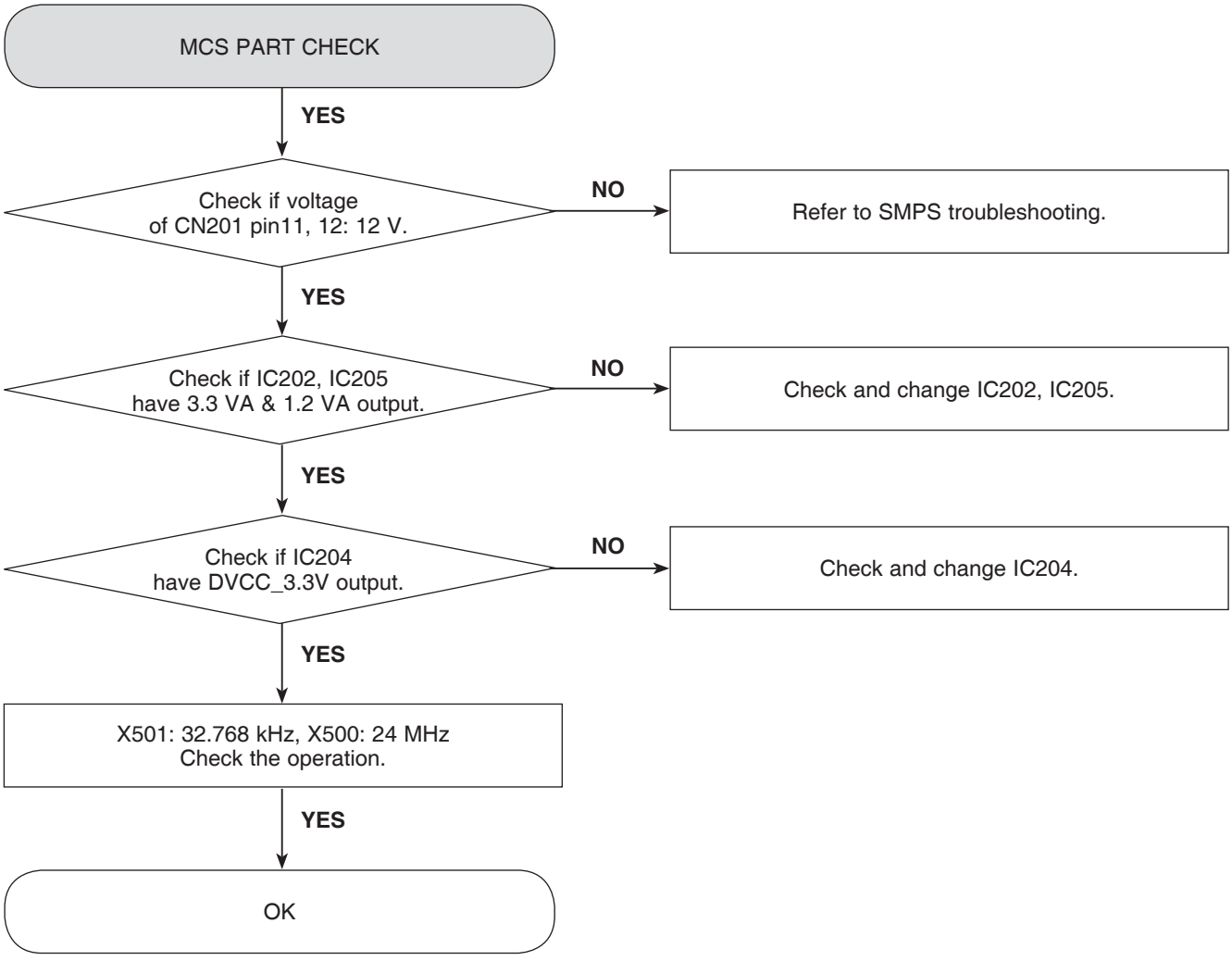
ELECTRICAL TROUBLESHOOTING GUIDE

POWER



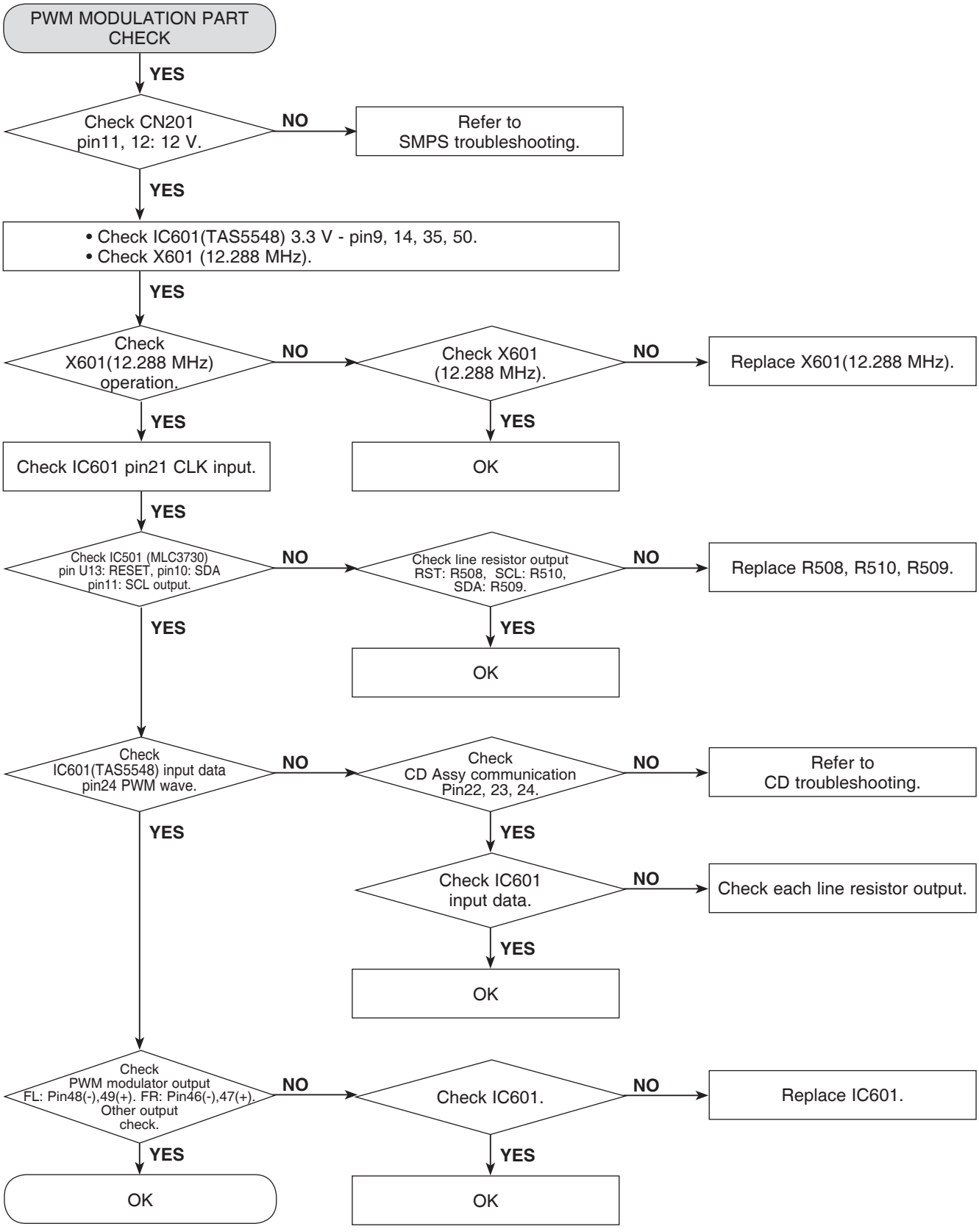


2. MCS PART CHECK



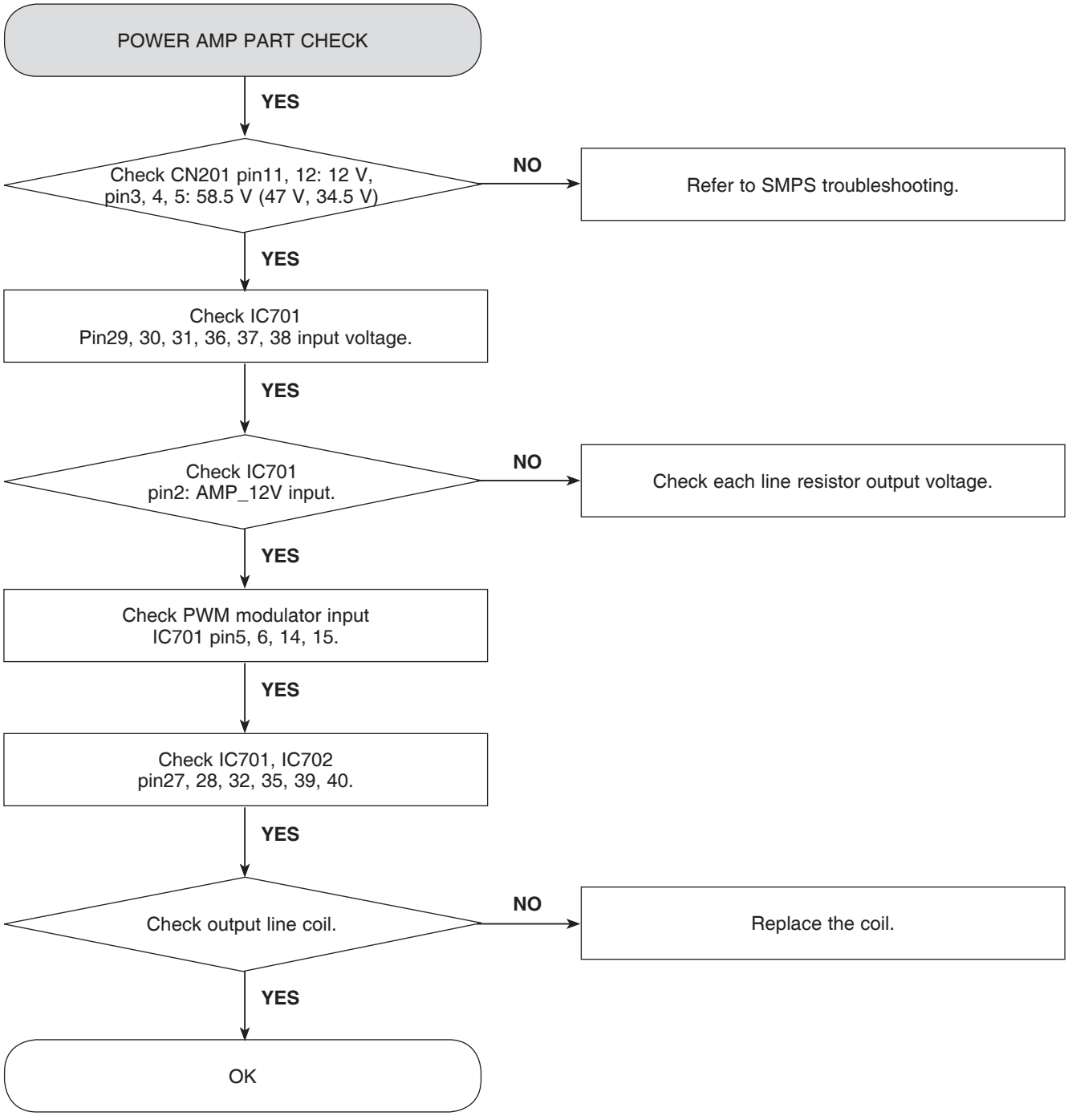
ELECTRICAL TROUBLESHOOTING GUIDE

3. PWM MODULATION CHECK



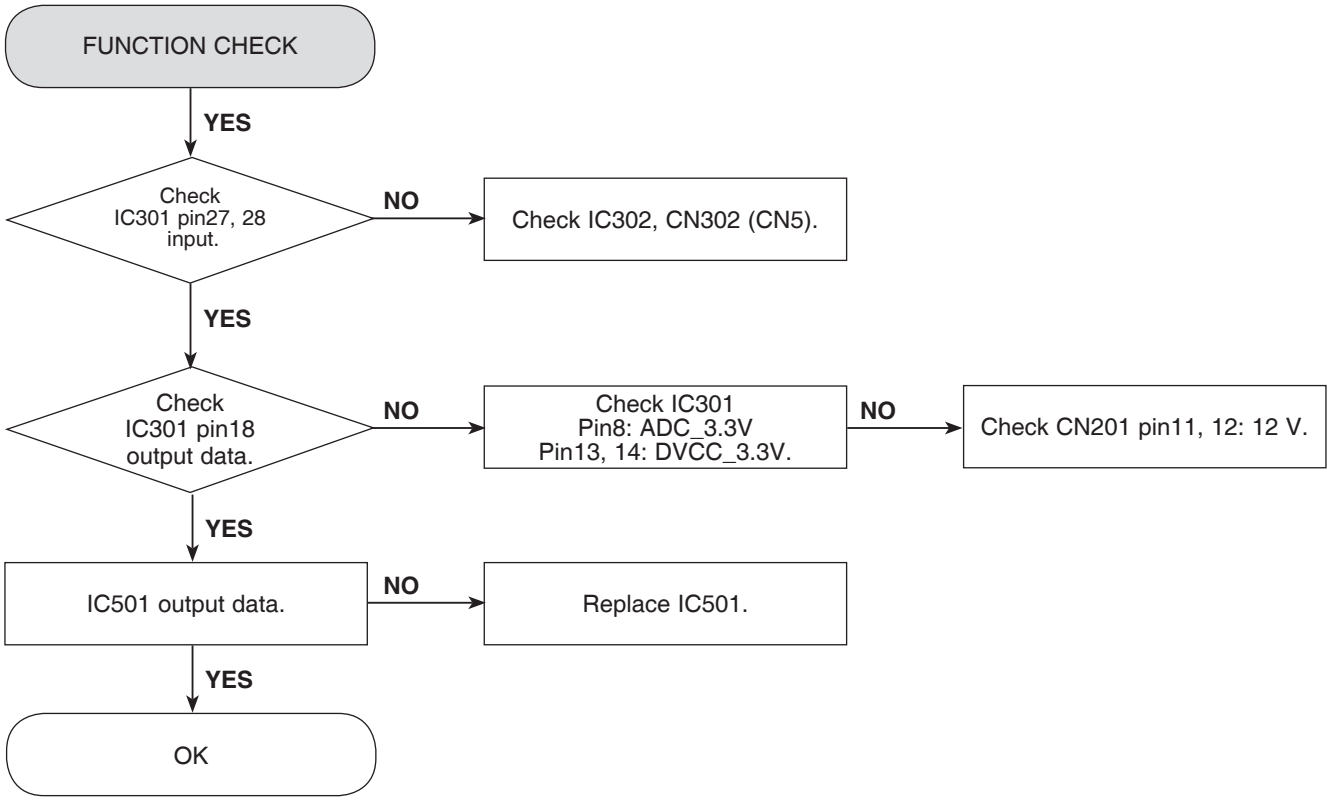
ELECTRICAL TROUBLESHOOTING GUIDE

4. POWER AMP PART CHECK



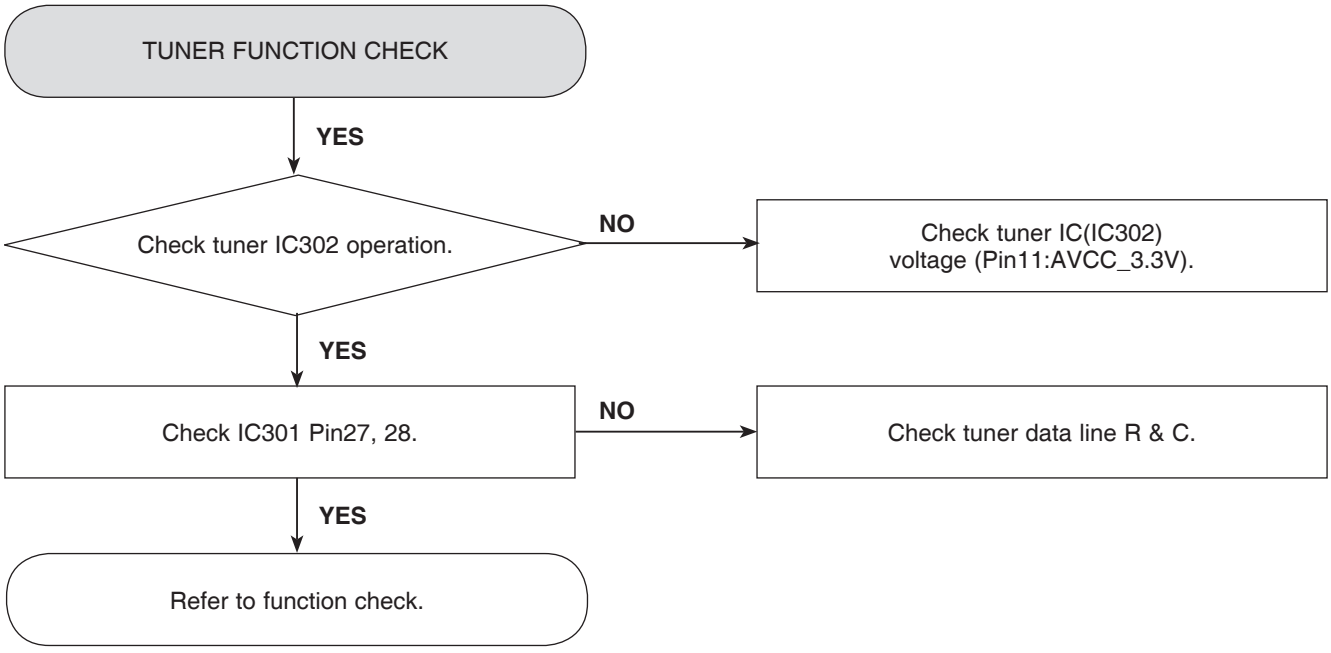
ELECTRICAL TROUBLESHOOTING GUIDE

5. TUNER / DAB FUNCTION CHECK



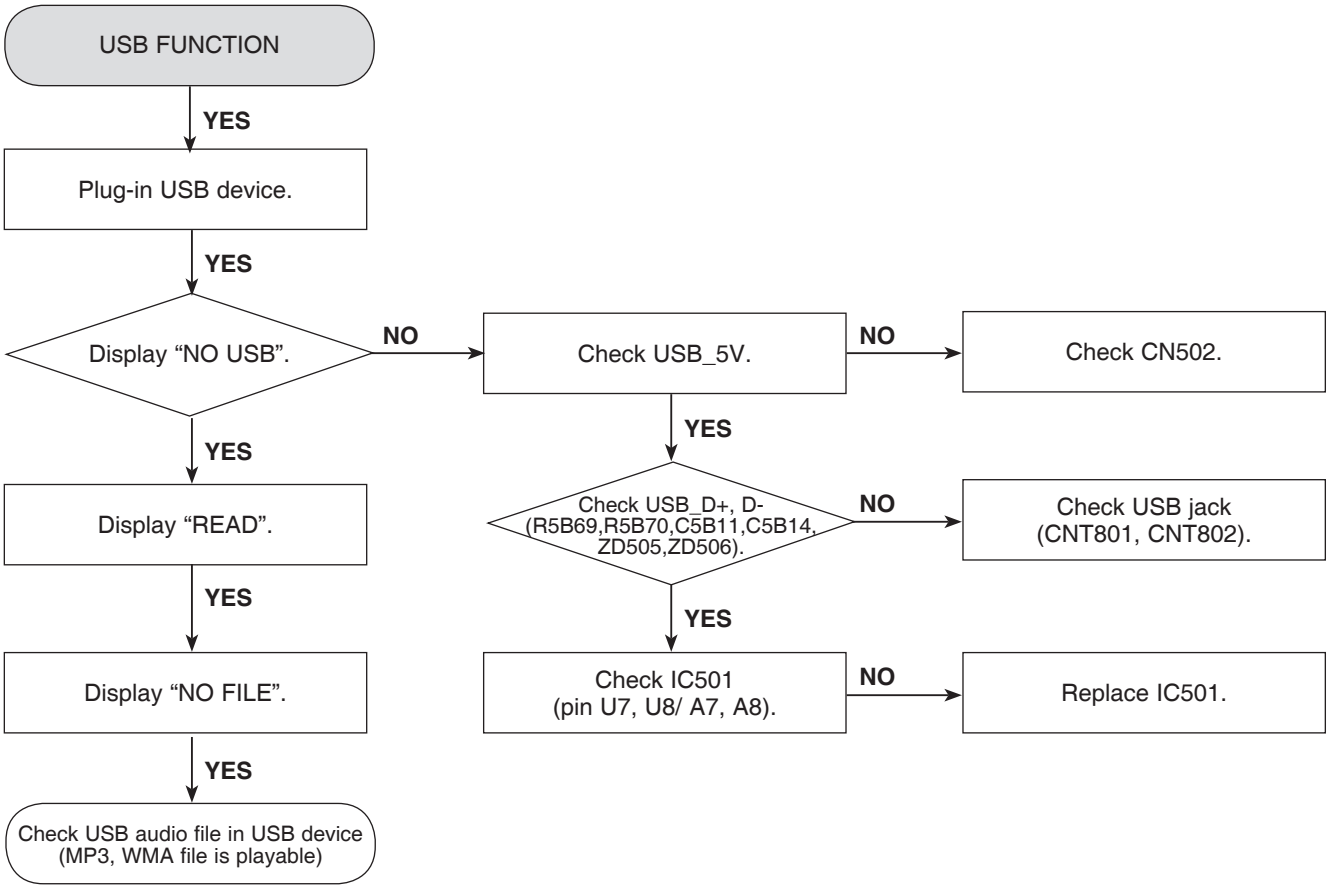
ELECTRICAL TROUBLESHOOTING GUIDE

6. TUNER FUNCTION CHECK



ELECTRICAL TROUBLESHOOTING GUIDE

7. DOUBLE USB FUNCTION



WAVEFORMS OF MAJOR CHECK POINT

1. DSP (IC501)

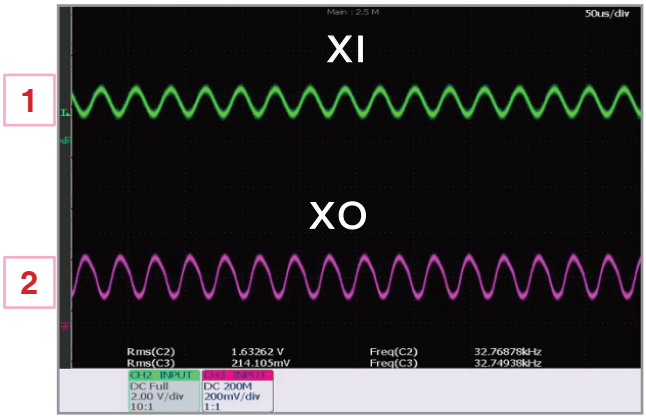


Fig 1-1. X501: Crystal of RTC 32.768 MHz
(R5B94 both side)

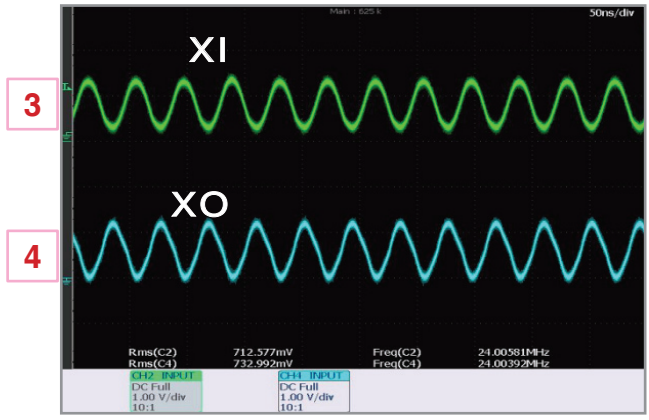
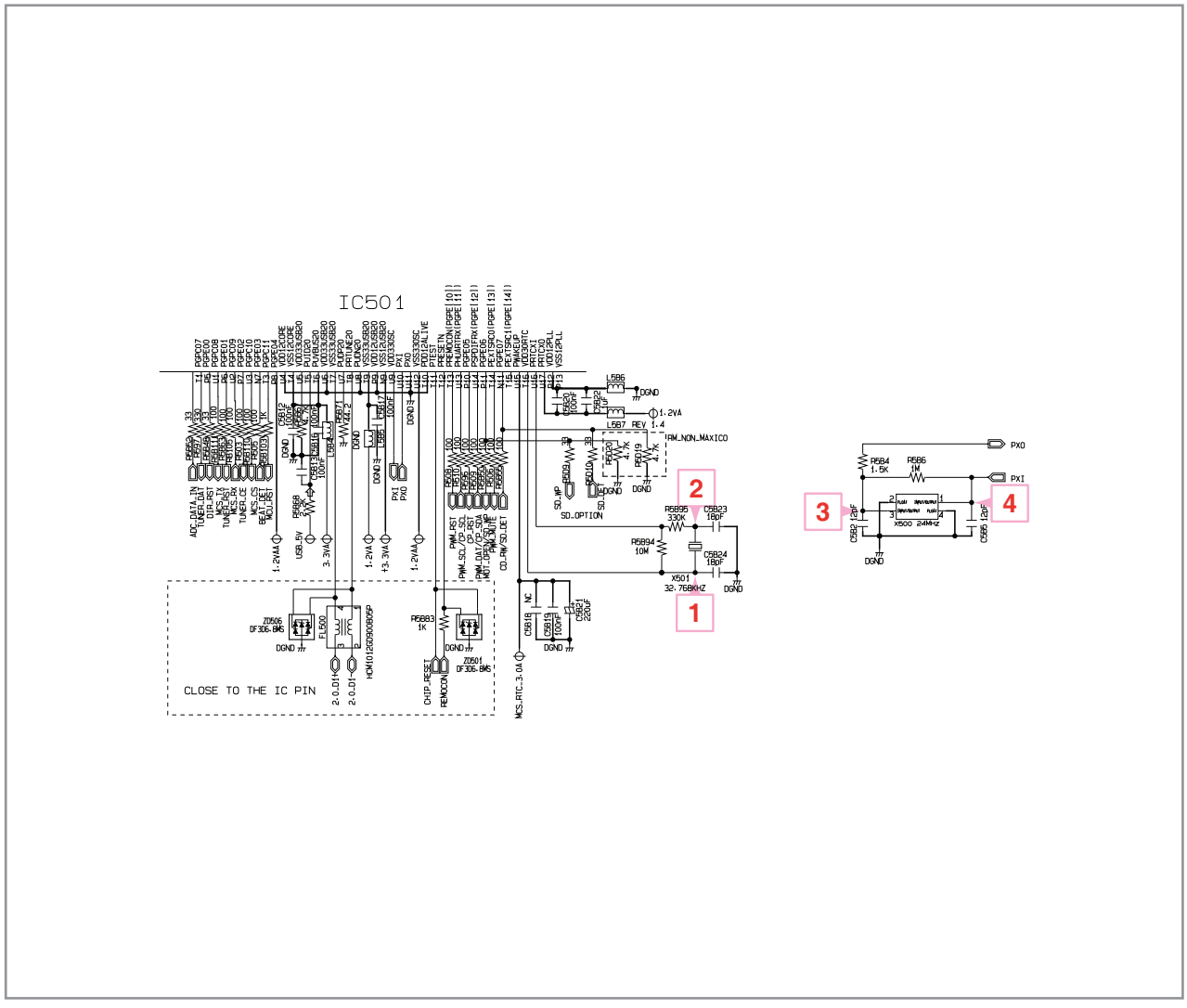
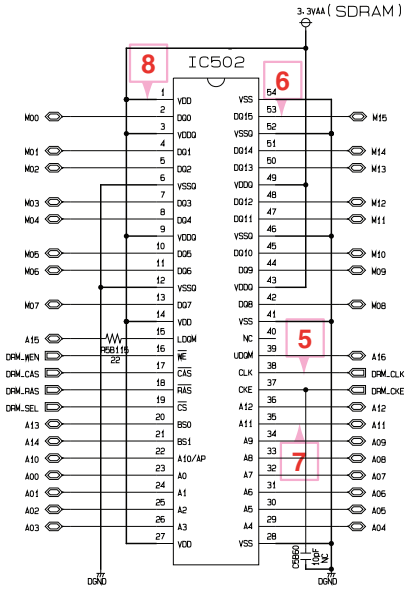


Fig 1-2. X500: Crystal of system 24 MHz
(MAIN DSP : R5B6, C5B5)



2. SDRAM (IC502)

Fig 2. SDRAM



3. SERVO (IC401)

Fig 3-1. X400: Crystal 16.9344 MHz

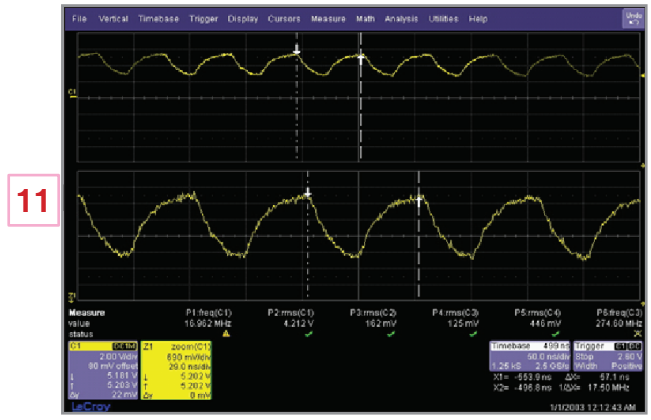
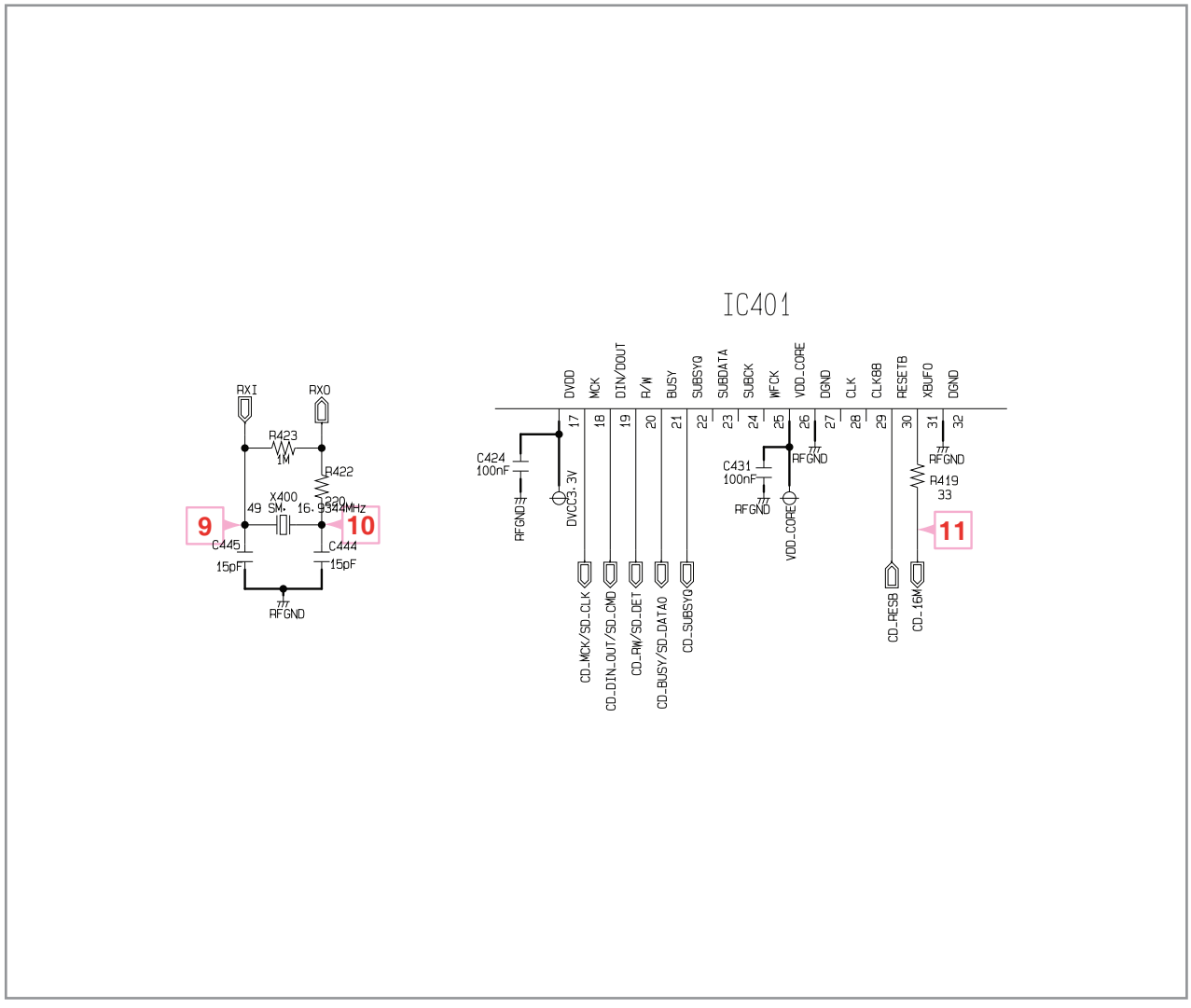


Fig 3-2. CD-16M
(IC401 pin31)

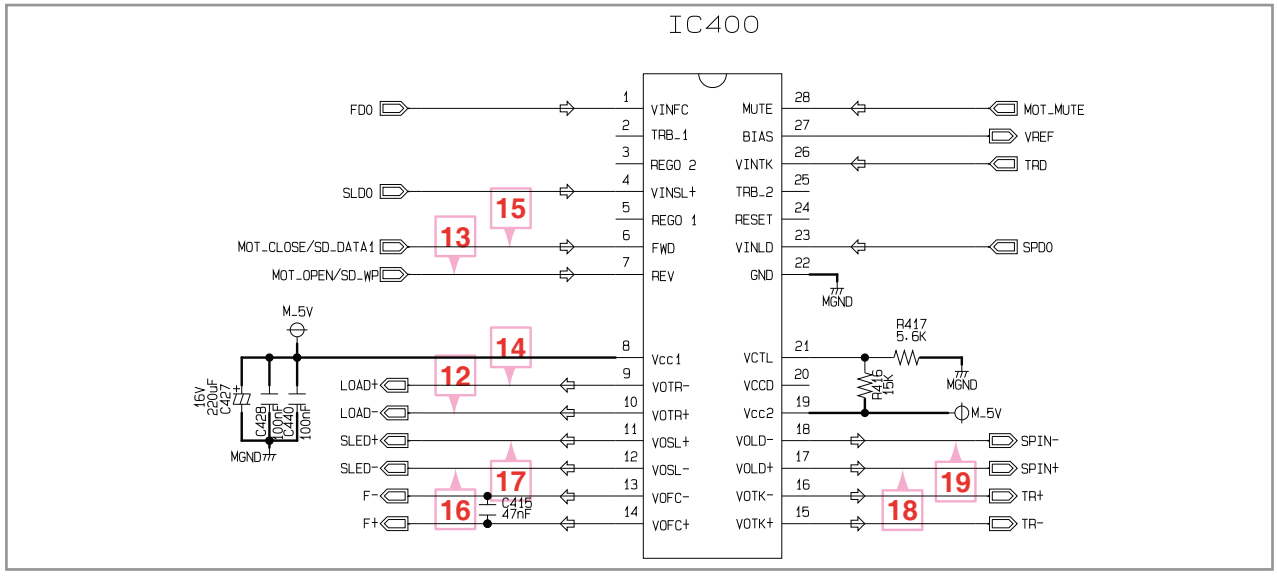


4. MOTOR DRIVER (IC400)

Fig 4-1. LO- & LO+ / MOT_OPEN &MOT_CLOSE for Driving TRAY Motor (IC400 Pin6, 7, 9, 10)

Fig 4-2. SL- & SL+ for Driving SPINDLE Motor (IC400 Pin11, 12)

Fig 4-3. SP- & SP+ for Driving SPINDLE Motor (IC400 Pin17, 18)



5. ADC (IC301)

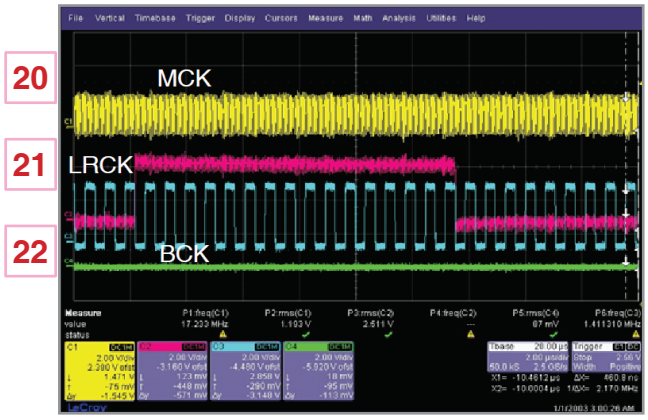


Fig 5. ADC I2S
(IC301 Pin15, 16, 17)

6. USB (CN502)

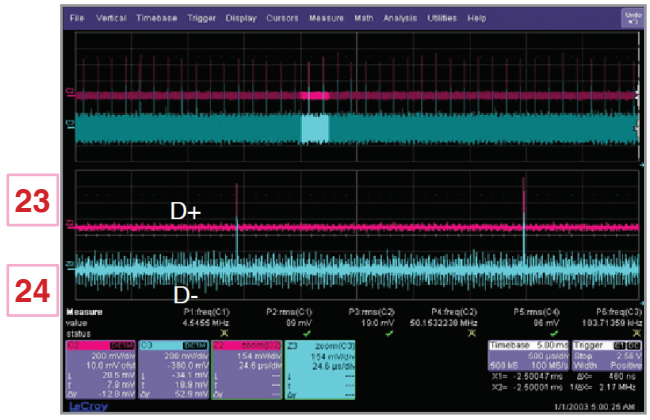
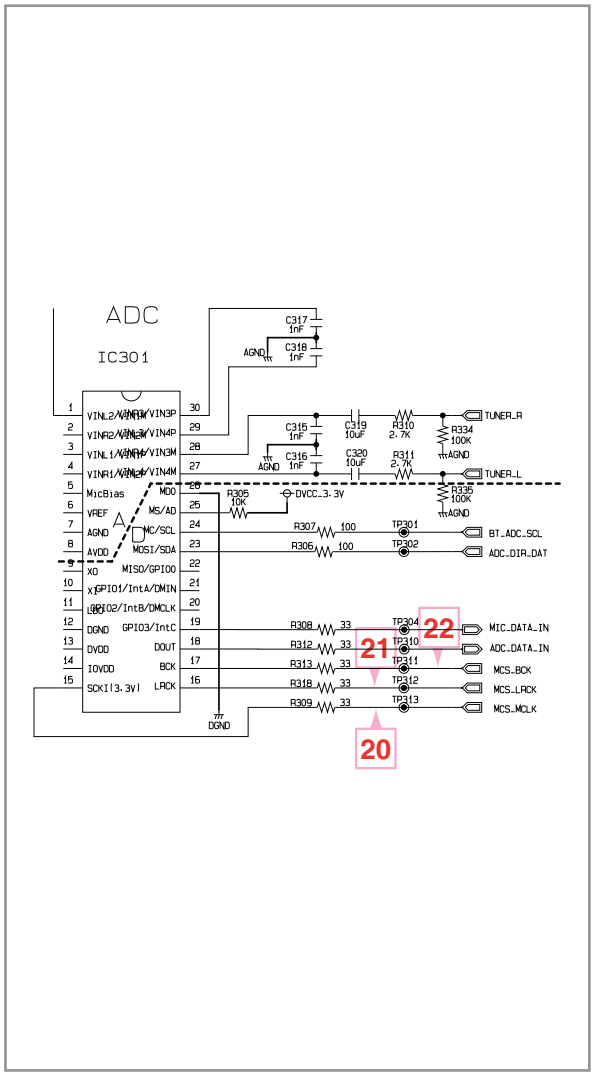
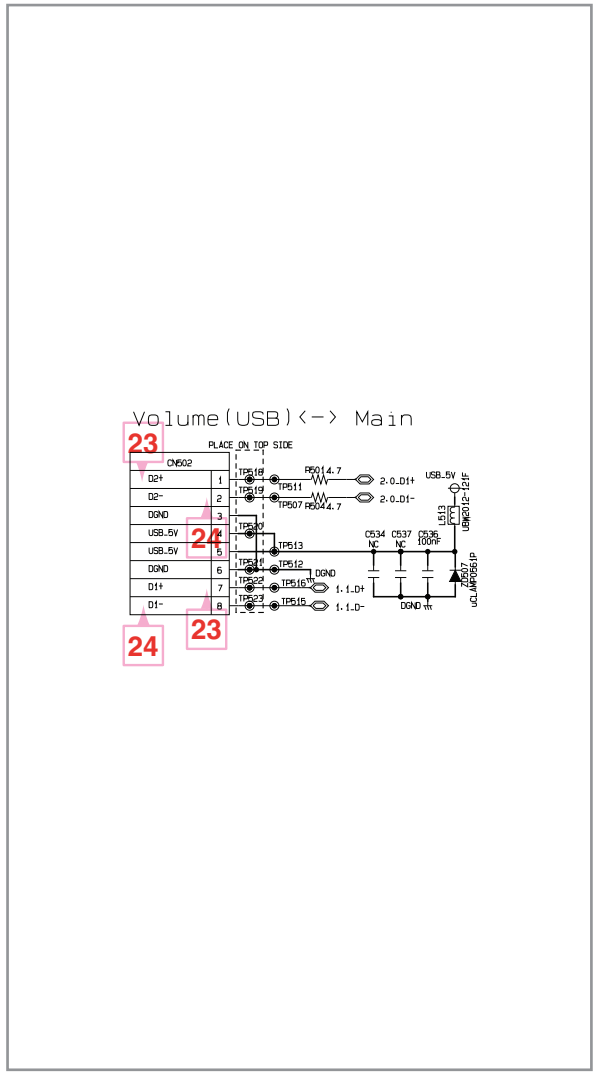


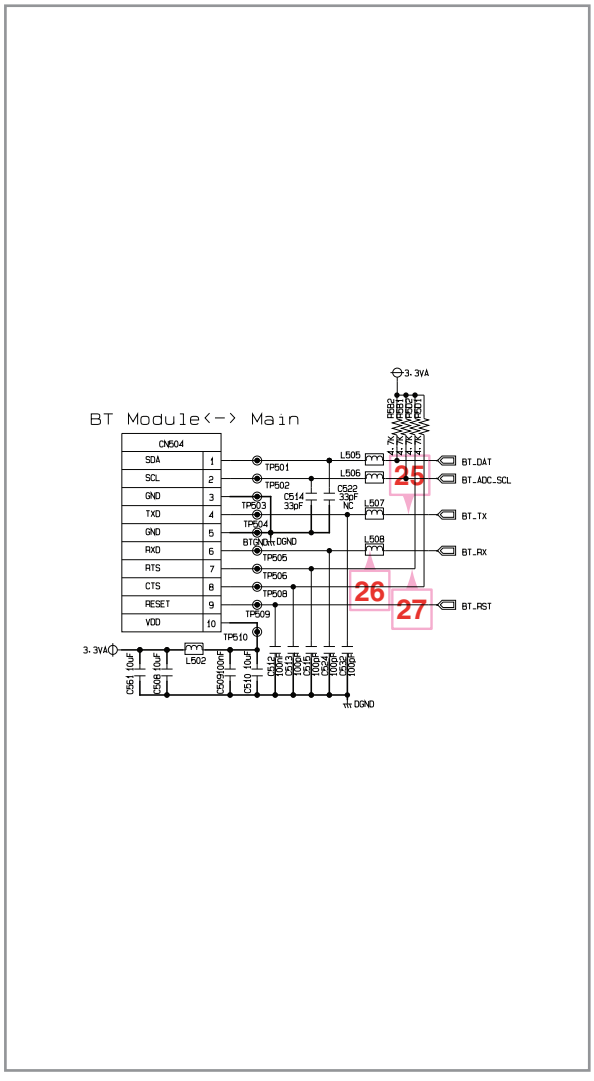
Fig 6. USB D+/D-
(CN502 Pin1, 2, 7, 8)



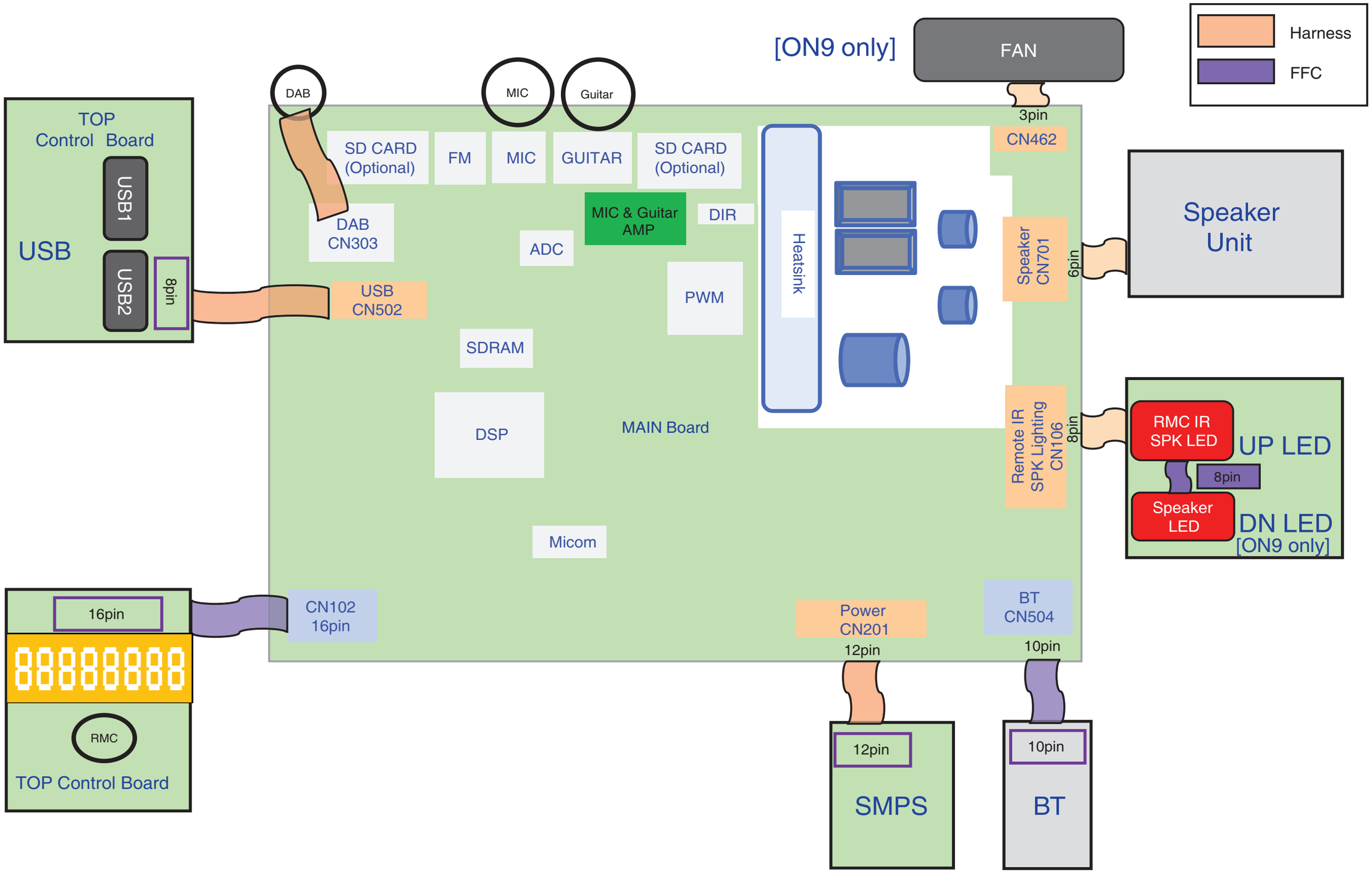


7. BLUETOOTH (CN504)

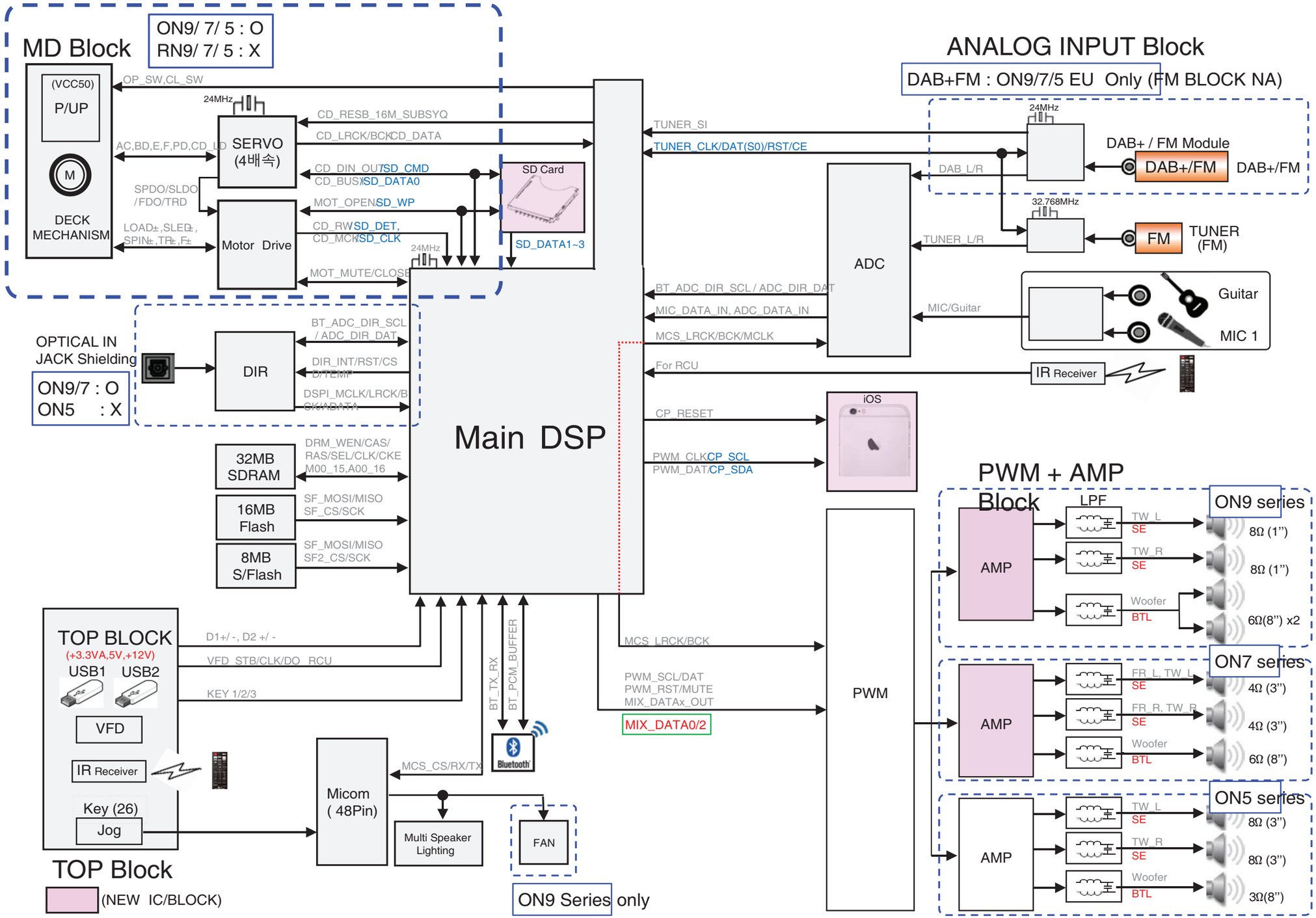
Fig 7. BT_TX / BT_RX / BT_RST



WIRING DIAGRAM



BLOCK DIAGRAM



CIRCUIT VOLTAGE CHART

1. IC VOLTAGE

NO.	PARTS SYMBOL	RATING SPEC.	RECOMMEND VOLTAGE(V)	MEASUREMENT VOLTAGE(V)	IC FUNCTION	IC TC TEMPERATURE SPEC.
1	**IC101** **IC, Microcontrollers**	VDD : 2.7 ~ 5.5 V	VDD : 3.34 V	VDD : 3.34 V	IC, Microcontrollers	85 °C
2	**IC201** **DC, DC Converter**	VIN : 4.5 ~ 17 V	Vin : 12.10 V	Vin : 12.10 V	Step-Down Converters	125 °C
3	**IC202** **DC, DC Converter**	VIN : 2.5 ~ 5.5 V	Vin : 5.13 V	Vin : 5.13 V	Step-Down Converters	125 °C
4	**IC203** **DC, DC Converter**	VIN : 4.5 ~ 17 V	Vin : 12.10 V	Vin : 12.10 V	Step-Down Converters	125 °C
5	**IC204** **Limit Switch**	VIN : 2.5 V ~ 5 V	VDD : 3.34 V	VDD : 3.34 V	Power-distribution switch	125 °C
6	**IC205** **DC, DC Converter**	VIN : 2.5 ~ 5.5 V	Vin : 5.13 V	Vin : 5.13 V	Step-Down Converters	125 °C
7	**IC206** **Limit Switch**	VIN : 2.5 ~ 5 V	Vin : 5.13 V	Vin : 5.13 V	Power-distribution switch	125 °C
8	**IC207** **Limit Switch**	VIN : 2.5 ~ 5 V	Vin : 5.13 V	Vin : 5.13 V	Power-distribution switch	125 °C
9	**IC208** **LDO**	VIN : ~ 6 V	Vin : 5.13 V	Vin : 5.13 V	1A Ultra Low Dropout Linear Regulator	125 °C
10	**IC301** **4ch Audio ADC**	AVDD : 3.0 ~ 3.6 V DVDD : 3.0 ~ 3.6 V	AVDD : 3.36 V DVDD : 3.3 V	AVDD : 3.36 V DVDD : 3.3 V	2ch and 4ch Audio ADCs with Universal Front End Input Mux	125 °C
11	**IC302** **TUNER**	VA : 2.7 ~ 35.5 V	VA : 3.36 V	VA : 3.36 V	TUNER	85 °C
12	**IC303** **Audio line driver**	PVDD : 3 ~ 5.5 V	PVDD : 3.36 V	PVDD : 3.36 V	3VRMS Line driver	85 °C
13	**IC304** **Sample rate converter**	VL : 1.71 ~ 5.25 V VA : 3.135 ~ 3.465 V V_REG : 3.135 ~ 3.465 V	VL : 3.3 V VA : 3.3 V V_REG : 3.3 V	VL : 3.3 V VA : 3.3 V V_REG : 3.3 V	24bit 192 khz sample rate converter	125 °C
14	**IC400** **Motor Driver**	VCC1 : 4.3 ~ 13.2V VCC2 : 4.3 ~ VCC1	VCC1 : 5.12 V VCC2 : 5.12 V	VCC1 : 5.12 V VCC2 : 5.12 V	5-channel BTL Driver	85 °C
15	**IC401** **Digital servo signal processing**	VDD1 : 2.7 ~ 3.6 V VDD_CORE : 1.4 ~ 1.65 V	VCC : 3.3 V VDD_CORE : 1.51 V	VCC : 3.3 V VDD_CORE : 1.51 V	Servo signal processor for compact disc player	85 °C
16	**IC501** **IC, Digital Signal Processors**	Core : 1.1 ~ 1.3 V VDD IO : 3.0 ~ 3.6 V	VDD33 : 3.34 VA Core : 1.2 VA	VDD33 : 3.34 VA Core : 1.2 VA	IC, Digital Signal Processors	85 °C
17	**IC502** **SDRAM**	VDD : 3.0 ~ 3.6 V	VDD : 3.34 V	VDD : 3.34 V	4 M x 4 BANKS x 16 BITS SDRAM	85 °C
18	**IC503** **Serial Flash Memory**	VDD : 3.0 ~ 3.6 V	VDD : 3.34 V	VDD : 3.34 V	SERIAL FLASH MEMORY	85 °C
19	**IC504** **Serial Flash Memory**	VDD : 3.0 ~ 3.6 V	VDD : 3.34 V	VDD : 3.34 V	SERIAL FLASH MEMORY	85 °C
20	**IC505** **Voltage Detector**	VIN : 1.1 ~ 5.5 V	VDD : 3.34 V	VDD : 3.34 V	3-PIN MICROPROCESSOR RESET CIRCUITS	85 °C
21	**IC506** **IOP CP Chip**	VCC : 1.62 ~ 5.5 V	VCC : 3.36 V	VCC : 3.36 V	Clsas 6 i-Pod 2.0C Ver 2.0C Class	85 °C
22	**IC601** **PWM IC**	DVDD : 3.0 ~ 3.6 V AVDD : 3.0 ~ 3.6 V	DVDD : 3.34 V AVDD : 3.36 V	DVDD : 3.34 V AVDD : 3.36 V	PWM IC	105 °C
23	**IC701** **AMP IC**	PVDD : 12 ~ 34 V GVDD, VDD : 10.8 ~ 13.2 V	PVDD : 34 V GVDD, VDD : 12 V	PVDD : 34 V GVDD, VDD : 12 V	AMP IC	125 °C

2. SMPS CAPACITOR & ZENER DIODE VOLTAGE

CAPACITOR			
NO.	LOCATION	SPEC.	SALES AREA
1	C901	460 V / 100 uF	W/W
ZENER DIODE			
NO.	LOCATION	CHECK	
1	ZD901, ZD904	33 V	
2	ZD902, ZD906	13 V	
3	ZD905, ZD912	20 V	

3. MAIN CAPACITOR VOLTAGE

NO.	LOCATION NO.	VALUE	110 V -20 % (88V, 60Hz) (V)	220 V +20 % (288 V, 50Hz) (V)	DESCRIPTION
1	**C101**	10 uF	3.34 V	3.34 V	DVCC_3.3V
2	**C122**	100 nF	12.03	12.03	VFD_12V
3	**C125**	1 uF	12.03	12.03	VFD_12V
4	**C214**	10 uF	5.12	5.12	+5.1V
5	**C271**	220 uF	5.12	5.12	USB_5V
6	**C2C11**	1 uF	12.10	12.10	AMP_12V
7	**C3A1**	220 uF	3.35	3.35	AVCC_3.3V
8	**C402**	100 uF	5.10	5.10	DVCC_5V
9	**C404**	100 uF	3.33	3.33	DVCC_3.3V
10	**C427**	220 uf	5.12	5.12	M_5V
11	**C479**	22 nF	12.03	12.03	+12V
12	**C480**	100 nF	10.90	0.00	FAN_DC
13	**C481**	100 uF	10.90	0.00	FAN_DC
14	**C614**	100 uF	3.33	3.33	DVCC_3.3V
15	**C713**	10 uF	12.10	12.10	AMP_12V
16	**C740**	220 nF	34.00	34.00	PVDD
17	**C748**	1000 uF	34.00	34.00	PVDD
18	**C903**	270 uF	119.00	404.00	1st Regulation Cap
19	**C909**	22 uF	15.40	15.40	IC901 Vcc
20	**C911**	47 uF	22.30	22.30	IC911 Vcc_1
21	**C914**	10 uF	19.40	19.40	IC911 Vcc_2
22	**C933**	2200 uF	12.09	12.09	12VA
23	**C934**	470 uF	12.08	12.08	12VA
24	**C952**	2200 uF	34.00	34.00	PVDD
25	**CT802**	47 uF	5.10	5.10	VCC_5V

4. CONNECTOR VOLTAGE

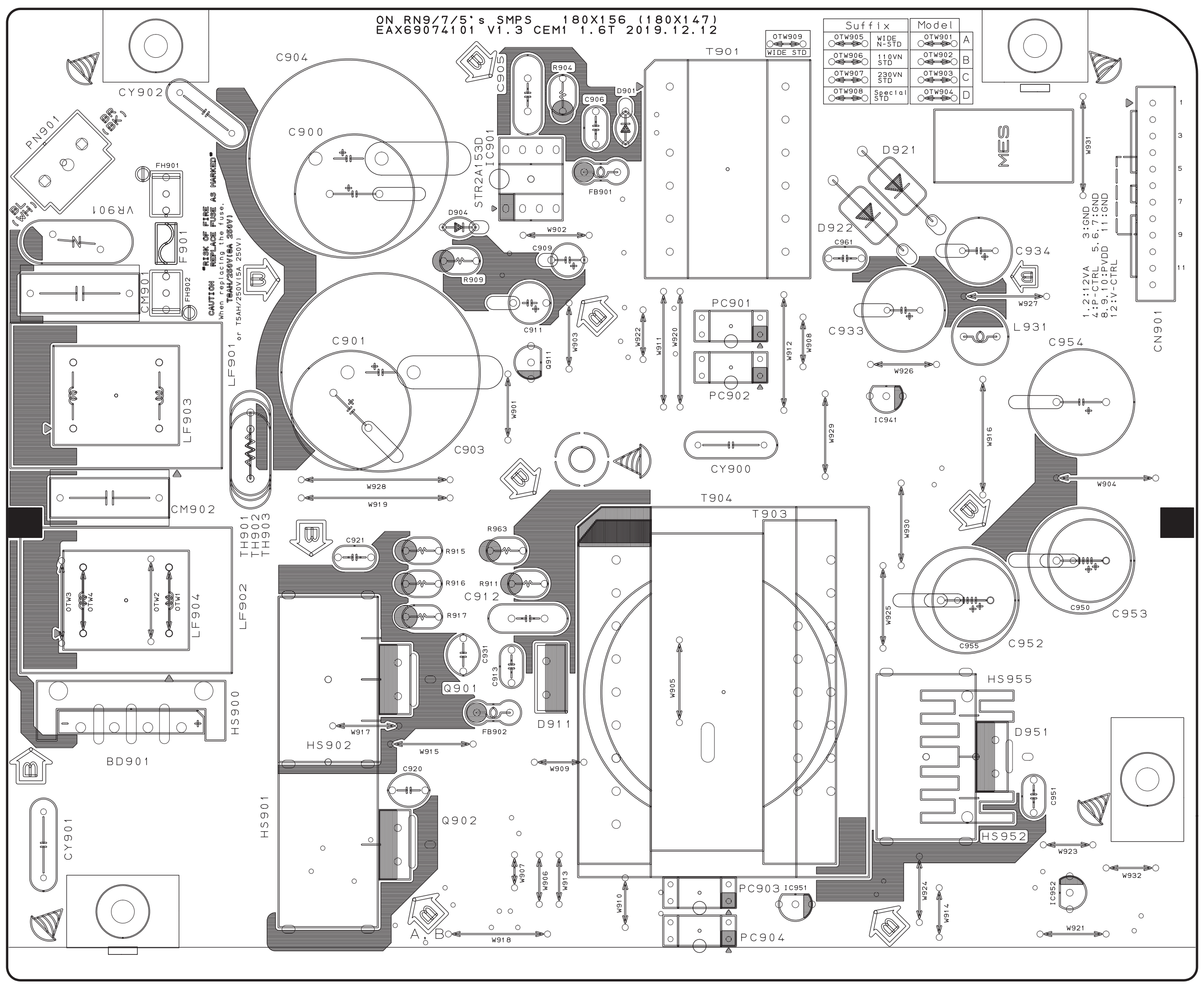
NO.	CON NO.	CON NAME	PIN NO.	PIN MANE	VOLTAGE(V)		CON NO.
					Vin	Vout	
1	**CN102**	MAIN ⇔ TOP	1	VF_12V	12.10	12.10	**CNT804**
			2	DGND	0.00	0.00	
			3	DV_5.0V	5.10	5.10	
			4	DV_5.0V	5.10	5.10	
			5	DV_3.3V	3.34	3.34	
			6	VFD_CLK	3.33	3.33	
			7	VFD_STB	3.33	3.33	
			8	VFD_DAT	3.33	3.33	
			9	DGND	0.00	0.00	
			10	DGND	0.00	0.00	
			11	KEY3	3.33	3.33	
			12	KEY2	3.33	3.33	
			13	KEY1	3.33	3.33	
			14	JOG_B	3.33	3.33	
			15	JOG_A	3.33	3.33	
			16	DGND	0.00	0.00	
2	**CN103**	MAIN ⇔ SD CARD	1	CD/DAT3	-	-	**SD CARD**
			2	CMD	-	-	
			3	VSS1	-	-	
			4	VDD	3.34	3.34	
			5	CLK	-	-	
			6	VSS2	-	-	
			7	DAT0	-	-	
			8	DAT1	-	-	
			9	DAT2	-	-	
			10	DETECT_ CONTACT	-	-	
			11	COM2	-	-	
			12	WRITE_PRO-TECT_CONTACT	-	-	
			13	GND	-	-	
3	**CN106**	MAIN ⇔ MULTI LIGHTING	1	SPKLED_B	-	-	**CNS301 CNS302**
			2	SPKLED_G	-	-	
			3	SPKLED_R	-	-	
			4	LGND	-	-	
			5	LGND	-	-	
			6	DGND	-	-	
			7	3.3VA	3.34	3.34	
			8	RMC	-	-	
4	**CN201**	MAIN ⇔ SMPS	1	12V	12.10	12.10	**CN901**
			2	12V	12.10	12.10	
			3	DGND	-	-	
			4	P_CTRL	-	-	
			5	DGND	-	-	
			6	DGND	-	-	
			7	DGND	-	-	
			8	PVDD	53.30	53.30	
			9	PVDD	53.30	53.30	
			10	PVDD	53.30	53.30	
			11	DGND	-	-	
			12	PVDD CTRL	-	-	

NO.	CON NO.	CON NAME	PIN NO.	PIN MANE	VOLTAGE(V)		CON NO.
					Vin	Vout	
5	**CN303**	MAIN ⇔ DAB MODULE	1	TUNER_L	-	-	**DAB MODULE**
			2	GND	-	-	
			3	TUNER_R	-	-	
			4	GND	-	-	
			5	DAB CE	-	-	
			6	DAB CLK	-	-	
			7	DAB MOSI	-	-	
			8	DAB MISO	-	-	
			9	TUNER RST	-	-	
			10	GND	-	-	
			11	GND	-	-	
			12	3.3V	3.36	3.36	
6	**CN502**	MAIN ⇔ TOP (USB)	1	D2+	3.30	3.30	**CNT803**
			2	D2-	0.00	0.00	
			3	DGND	0.00	0.00	
			4	USB_5V	0.00	0.00	
			5	USB_5V	0.00	0.00	
			6	DGND	5.09	5.09	
			7	D1+	0.00	0.00	
			8	D1-	0.01	0.01	
7	**CN504**	MAIN ⇔ BT Moudle	1	SDA	0.12	0.12	**BT Module**
			2	SCL	3.33	3.33	
			3	GND	0.00	0.00	
			4	TXD	3.33	3.33	
			5	GND	0.00	0.00	
			6	RXD	3.33	3.33	
			7	RTS	1.49	1.49	
			8	CTS	1.51	1.51	
			9	RESET	3.33	3.33	
			10	VDD	3.33	3.33	
8	**CN701**	MAIN ⇔ SPK	1	SW+	-		**SPK**
			2	SW-	-		
			3	FL+	-		
			4	FL-	-		
			5	FR+	-		
			6	FR-	-		

PRINTED CIRCUIT BOARD DIAGRAMS

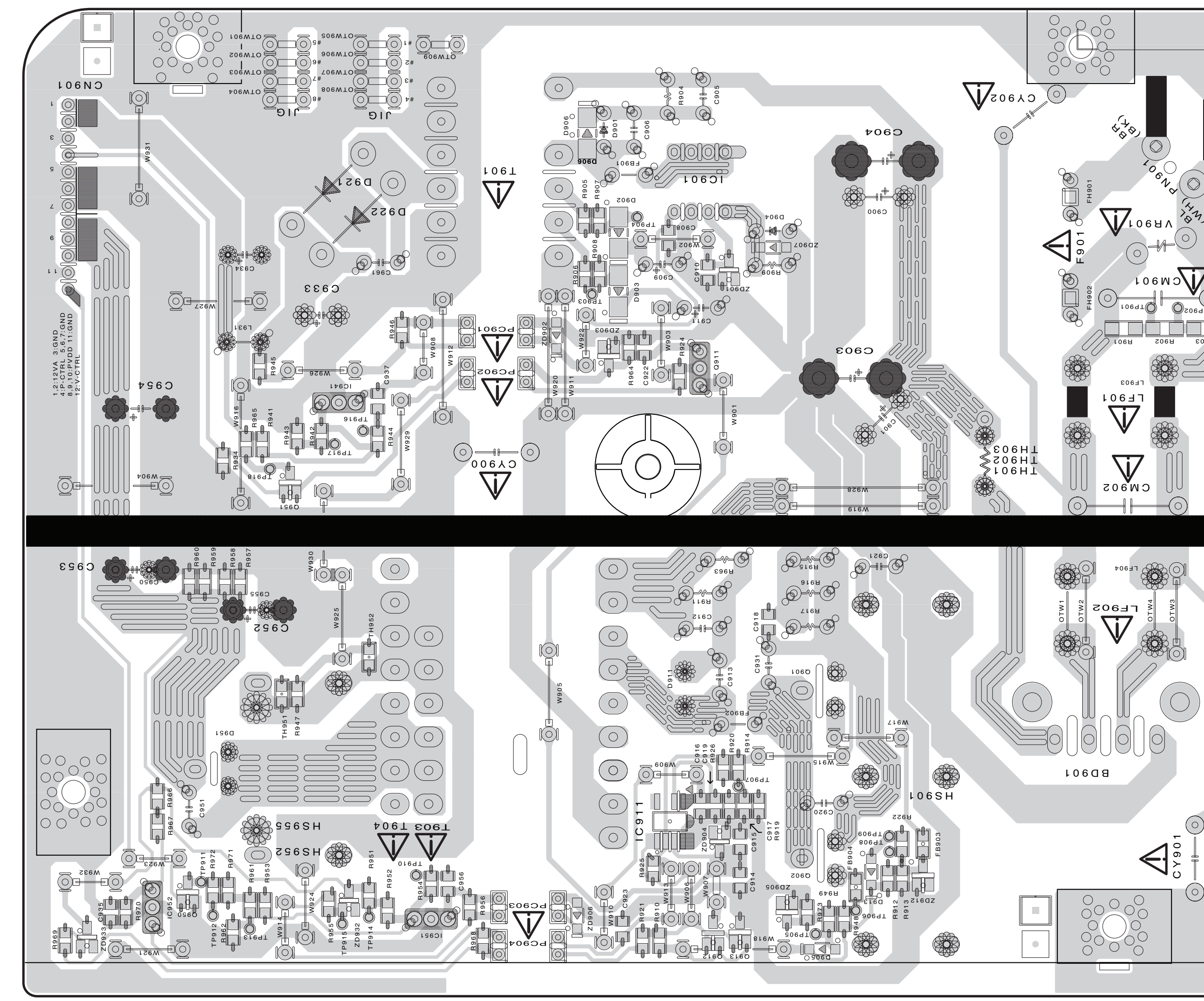
1. SMPS P.C.BOARD DIAGRAM

(TOP VIEW)

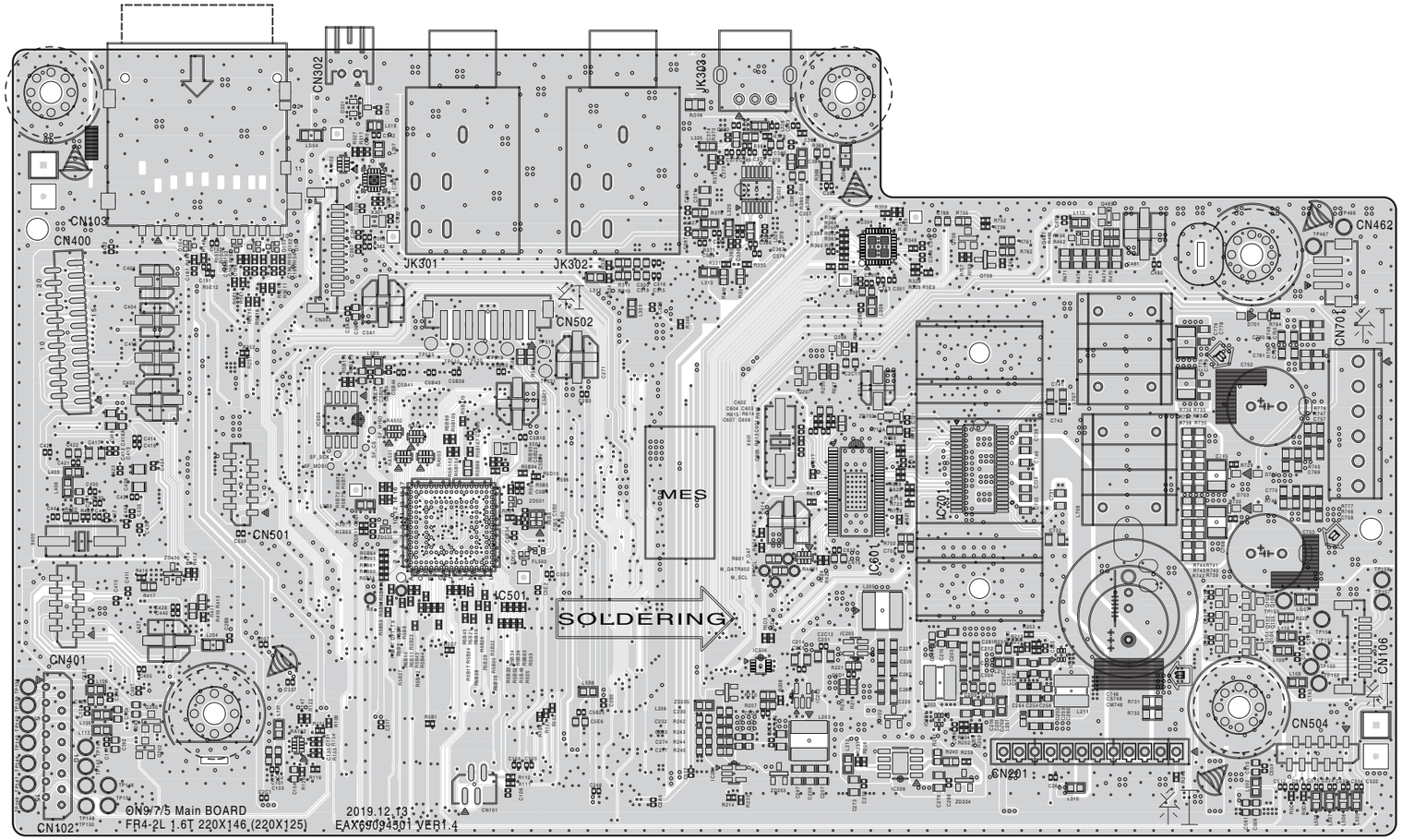


(BOTTOM VIEW)

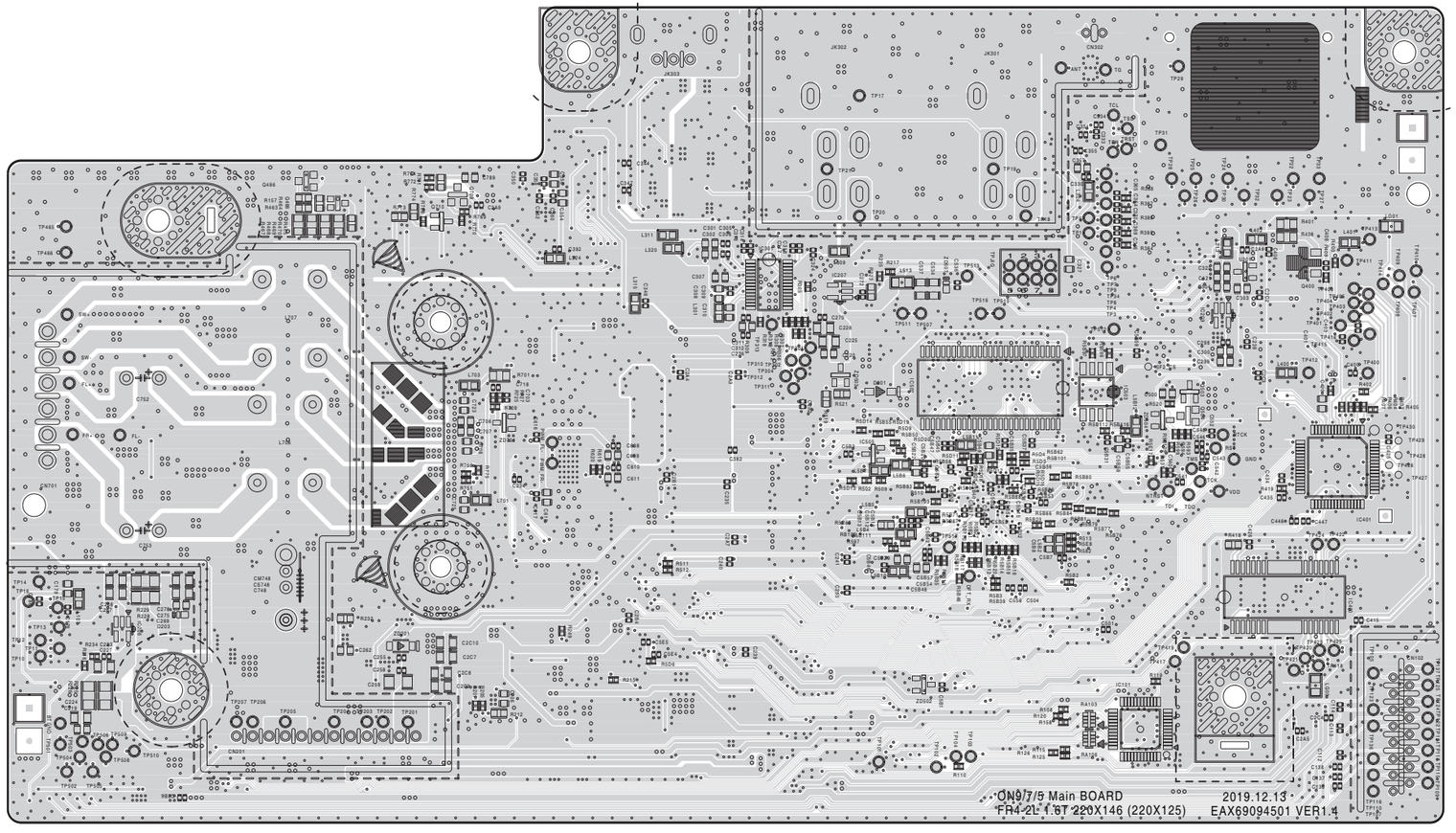
NOTE) Warning
⚠ Parts that are critical with respect to risk of fire or electrical shock.



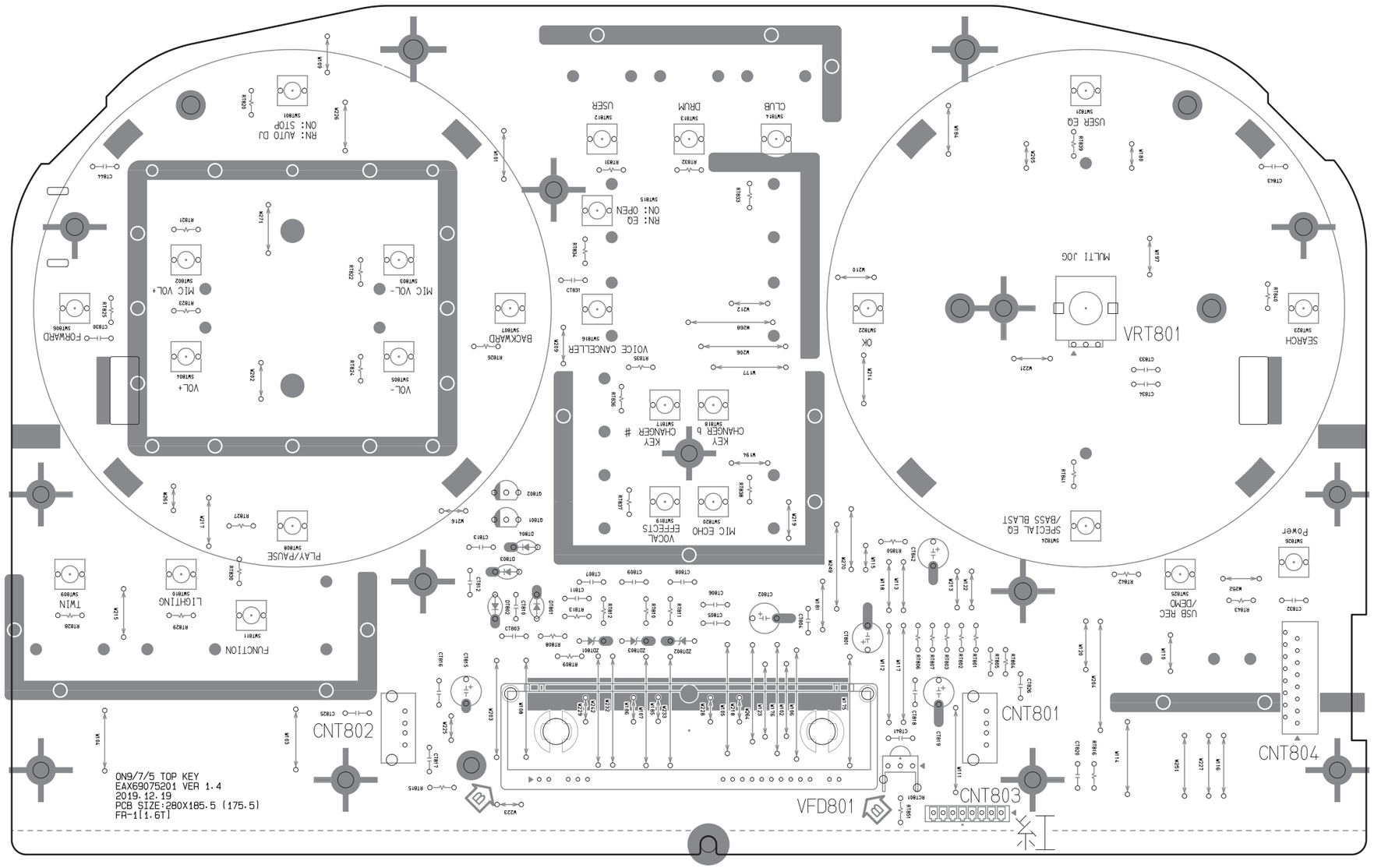
2. MAIN P.C.BOARD DIAGRAM
(TOP VIEW)



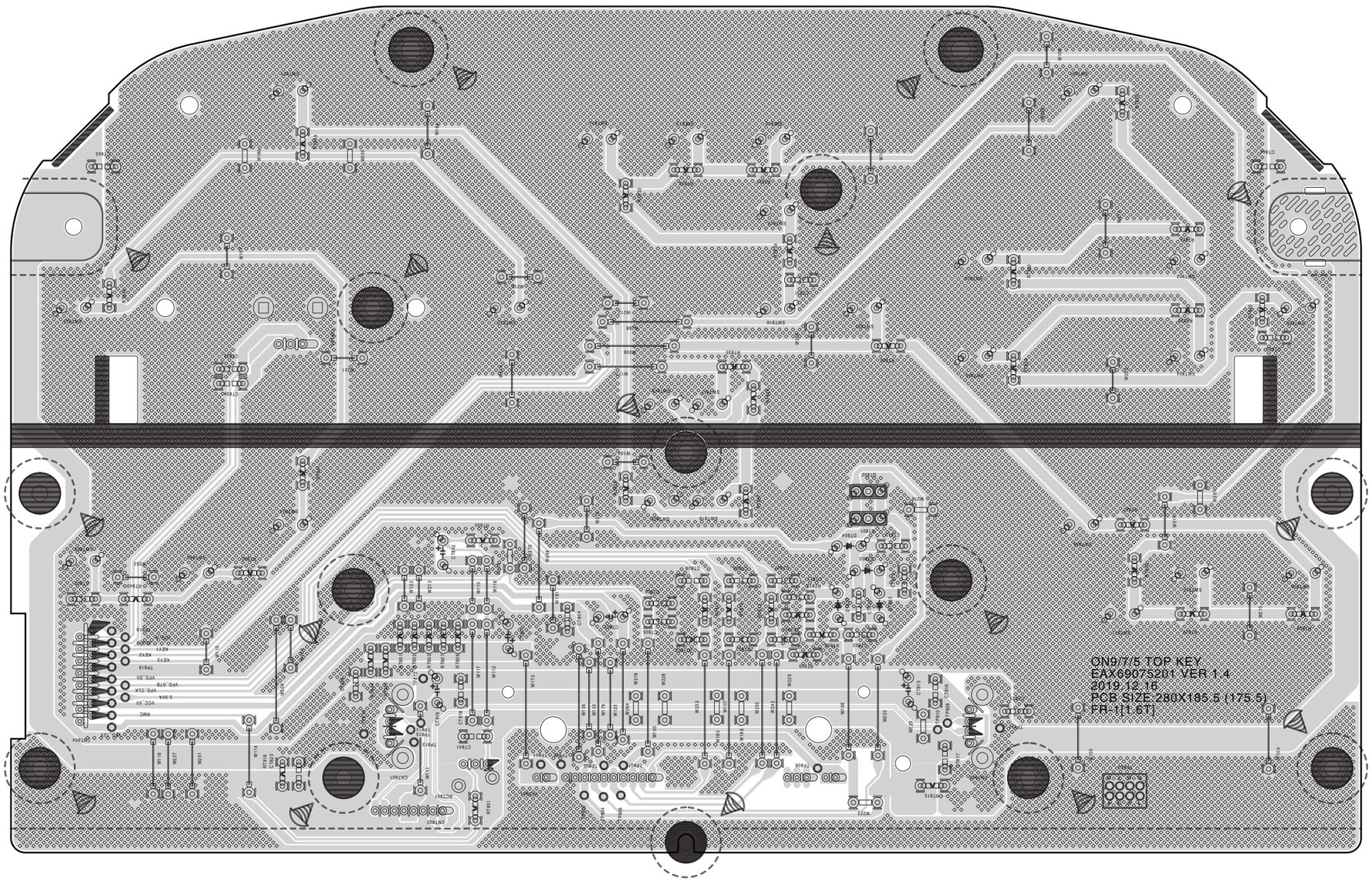
MAIN P.C.BOARD DIAGRAM
(BOTTOM VIEW)



3. TOP KEY P.C.BOARD DIAGRAM
(TOP VIEW)

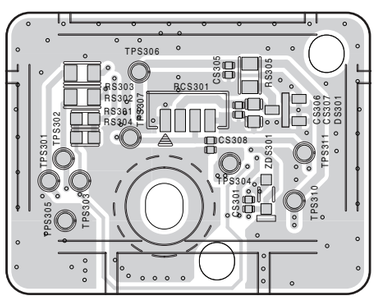


TOP KEY P.C.BOARD DIAGRAM
(BOTTOM VIEW)

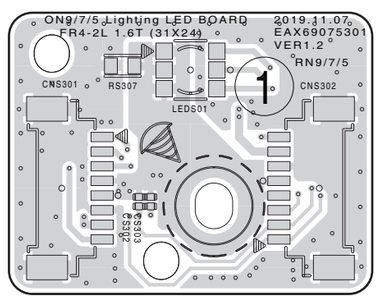


4. LIGHTING LED P.C.BOARD DIAGRAM

(TOP VIEW)

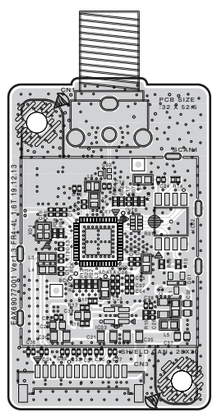


(BOTTOM VIEW)



5. DAB MODULE P.C.BOARD DIAGRAM

(TOP VIEW)



(BOTTOM VIEW)